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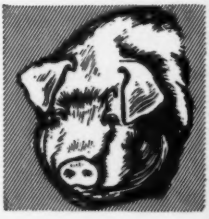

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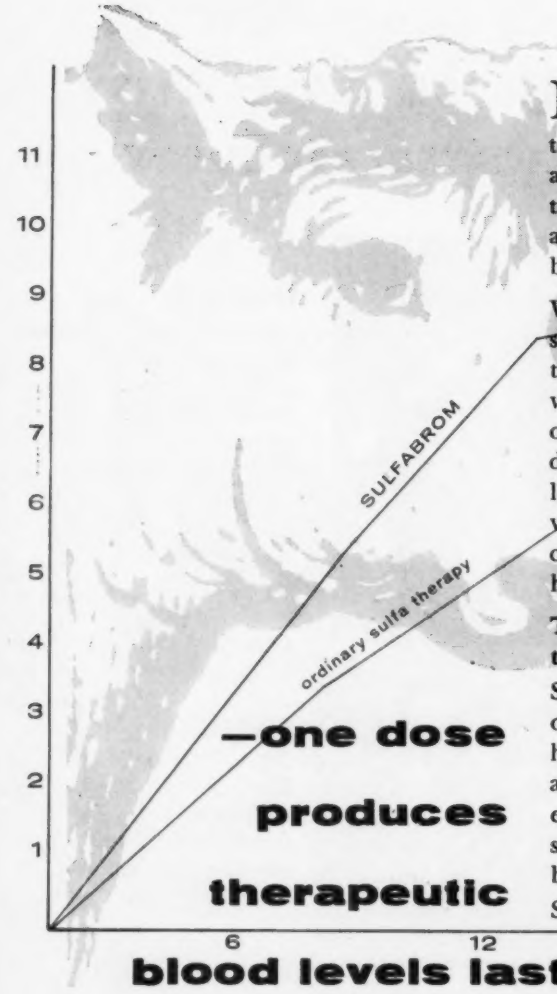

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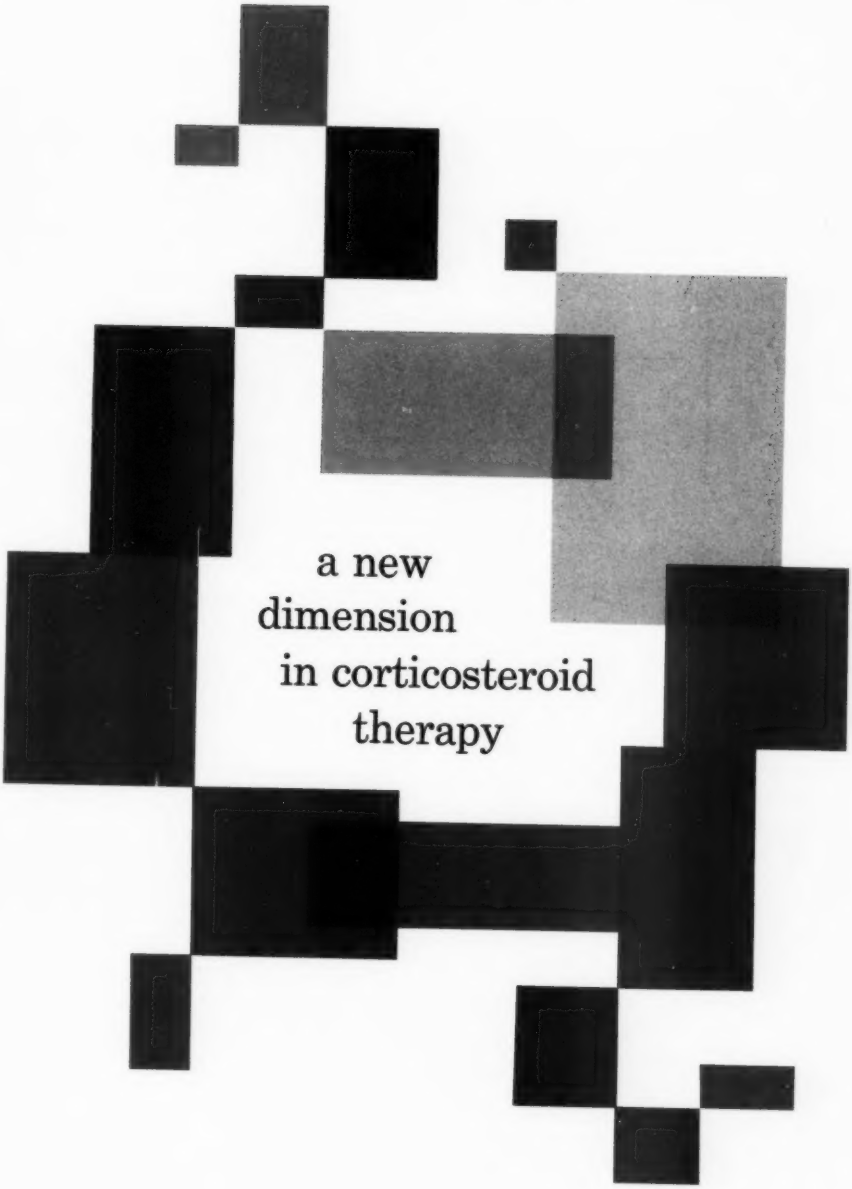
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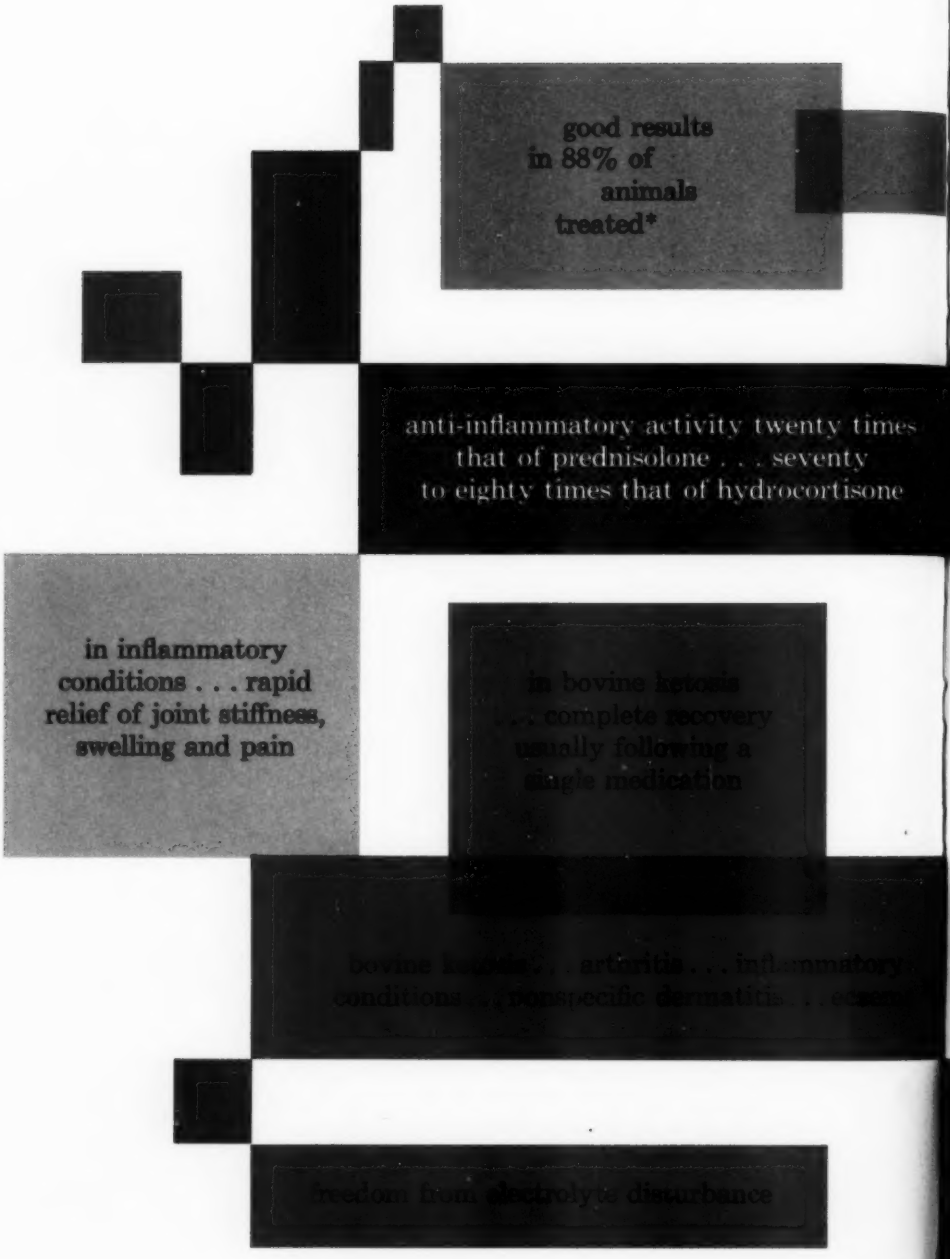
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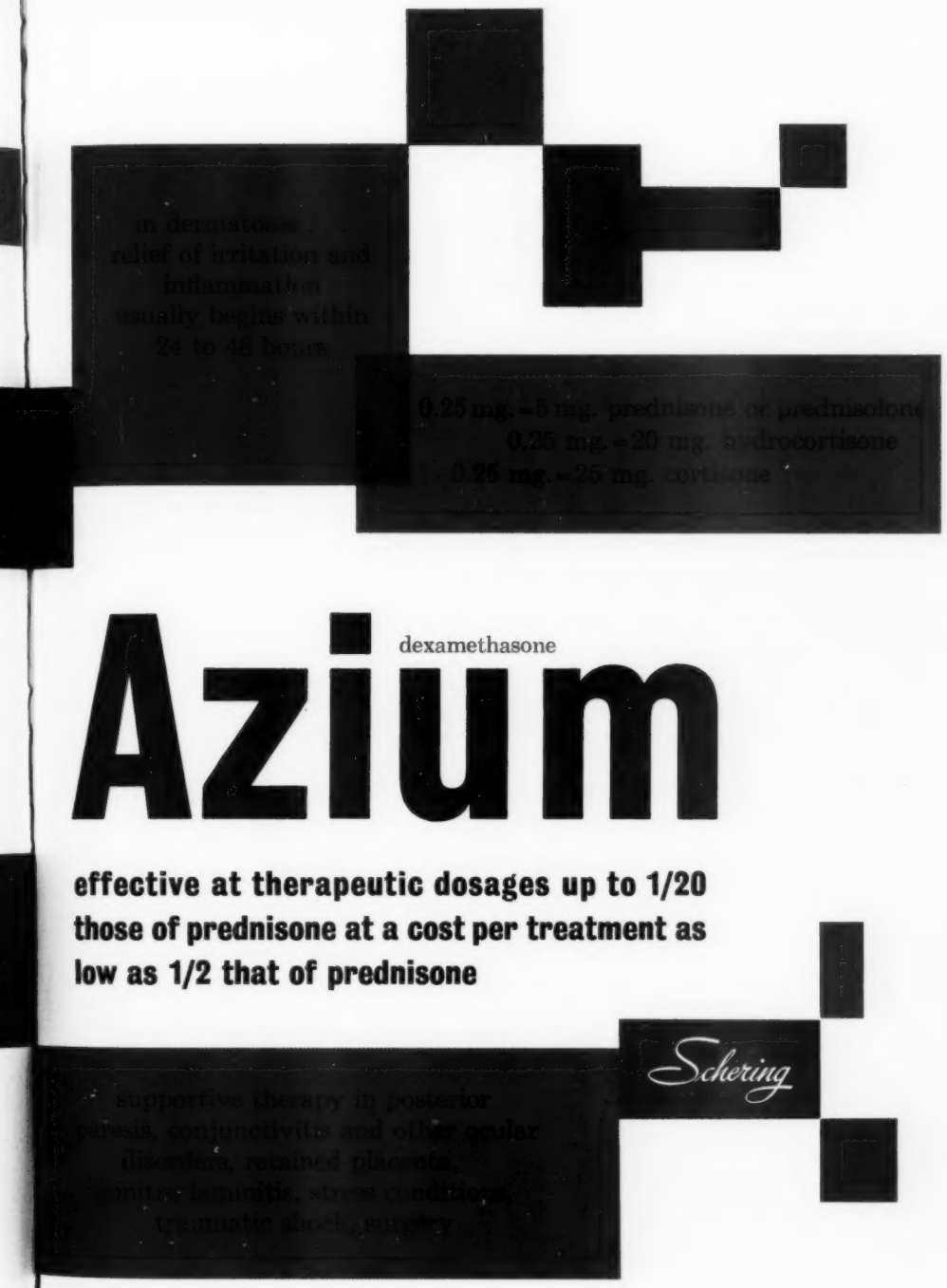
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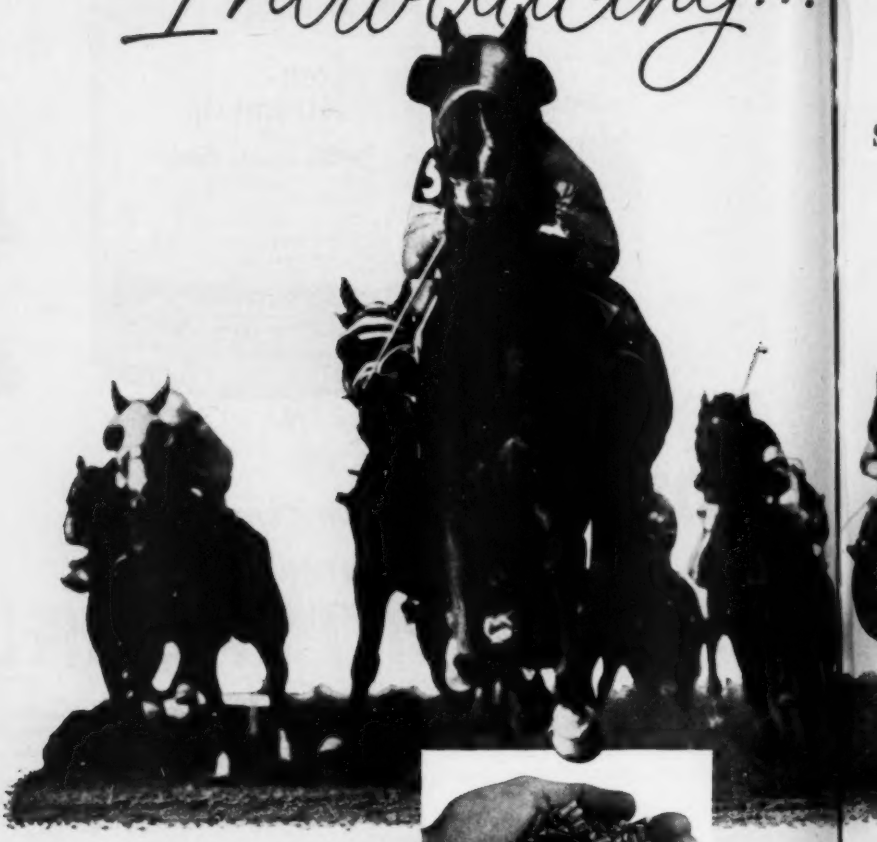

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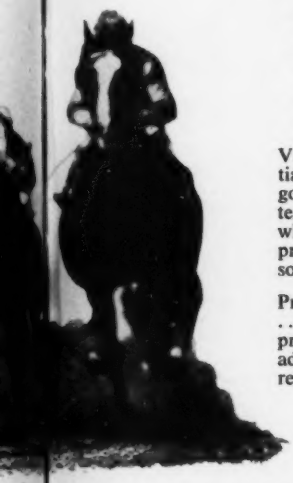

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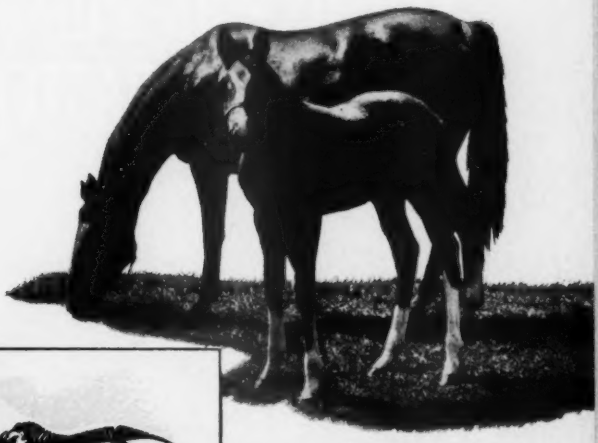
Manganese	1.87 mg. per oz. .0066 per cent
Calcium	1814 mg. per oz. 6.4 per cent
Phosphorus	1417 mg. per oz. 5.0 per cent
Salt	567 mg. per oz. 2.0 per cent



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News Comment

Pennsylvania Bans Live Virus

Pennsylvania brings to 24 the number of states that have banned live virus hog cholera vaccinations. The measure became law with the signature of the governor last month.

Hospitals for Profit

A coast-to-coast chain of proprietary hospitals has been calculated to be a profitable venture, and is now in process of being formed. David Seymour, president of the chains, says, "We've found that growth areas around the country lack hospital facilities and beds, and accountants tell us these hospitals can be quite profitable."

Auto Trip Insurance

Trip insurance, long popular for air travelers, is now being made available for those who must travel by automobile. Policies are now being sold in five Middle Atlantic states and the District of Columbia. Applicants simply call an agent and deposit 25 cents in a special box for every $2,500 desired. Boxes are available at service stations.

Distemper and Measles Virus

Reports in the literature have suggested an immunological relationship between canine distemper and human measles. Tests to establish the continuing relationship have been conducted in a California state hospital by U.C.L.A. Medical School workers. A total of 200 patients received distemper vaccine, 200 received influenza vaccine, and 200 mumps vaccine. The remaining 1,400 patients received no vaccines.

Three years later, when a measles epidemic hit the hospital, incidence among unvaccinated patients was significant (1,519). Only three of the 165 distemper vaccinated patients still hospitalized contracted measles.

Distemper vaccine used was a specially prepared product which differed somewhat from that used in animals. It is a live virus attenuated by repeated passage in eggs. No unfavorable side reactions have been noted. Results to date indicate that a measles vaccine may be on the way.

Demand for Meat Type Hogs

In Terre Haute, Indiana last month, hog raisers, a packer, and a grocery chain launched an experiment to discover whether housewives really wanted cuts from meat type hogs. Farmers are to get an additional 50 cents per hundred-weight for meat-type hogs; the packer is packaging the product under a special name, and the grocer is selling the meat-type cuts alongside average pork products. The rest is up to the consumer.

Unusual Transplants

An extraordinary operation in which an extra head and forelegs were transplanted into the neck of the dog was termed a success, according to a Medical News report. At last report, the animal was still healthy after 20 days. Dr. Vladimir Demikhov, Moscow Medical Institute, reported that 20 such operations had been performed in the past two decades, but previously none of the subjects lived more than six days.

Penicillin in Milk

Penicillin mastitis preparations may be placed on the veterinary prescription legend by the F.D.A. as a stop-gap measure, according to informed sources. Many expect the F.D.A. to eventually outlaw use of the antibiotic in mastitis products. Presence of residual penicillin in market milk has been calculated by F.D.A. officials to pose a health hazard for extremely sensitive persons. Existence of "extremely sensitive" people precludes the possibility of setting a "safe" tolerance for penicillin in milk.

Drug Trade Facts

According to the 1958 Drug Trade News survey, drug stores, with a 3.6% sales increase in livestock, poultry and pet health aids, are still the top outlet for these products--but a 9.7% increase by veterinarians rated a strong second. Drug stores accounted for $66,400,000 or 31% of the total $217,160,000 market whereas veterinarians handled $64,700,000 or 30% of the market.

In the pet field, veterinarians handle 50% of the biological volume compared to 25% for drug stores, but the stores get 68% of non-biological pet supplies volume while veterinarians handle 17%.

Veterinarians handled 43% of large animal biologicals and were also slightly ahead of drug outlets in non-biological livestock preparations, but the stores made substantial increases over veterinarians in mastitis products, scour remedies and worming agents.

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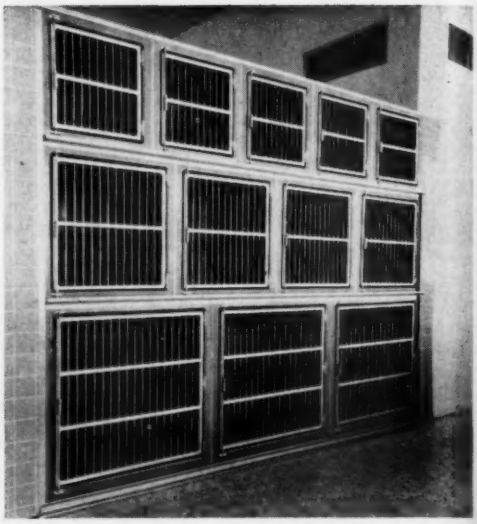

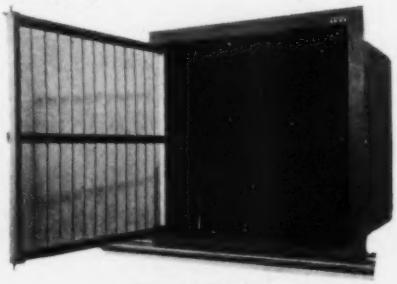

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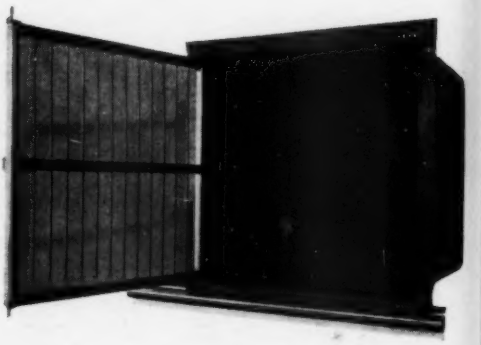

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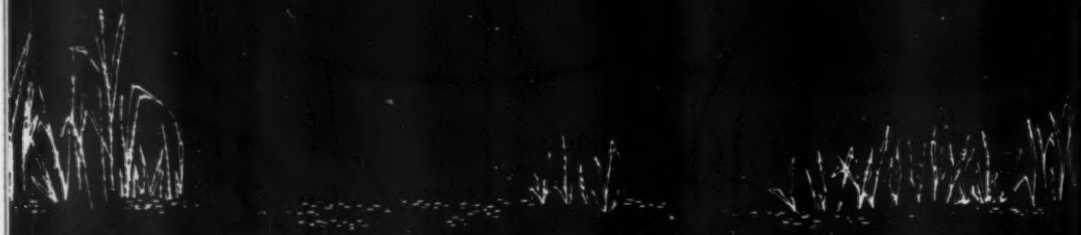

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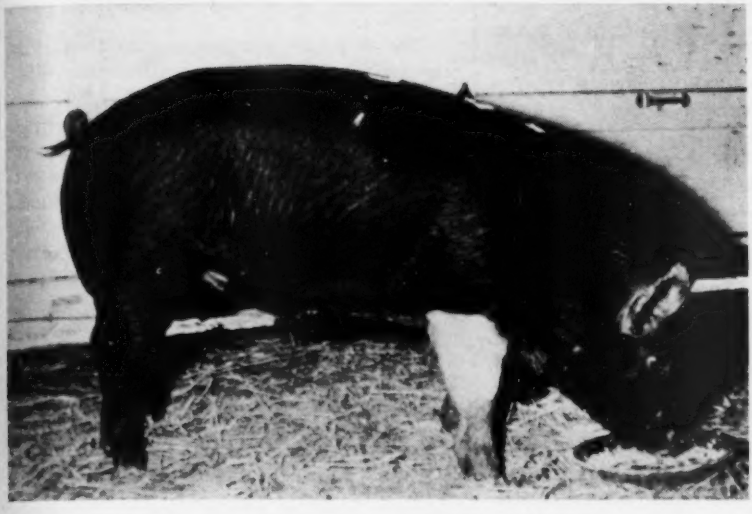


Changes in Swine Practice

MAYNARD SPEAR, D.V.M.

Extension Veterinarian
Iowa State College
Ames, Iowa

VETERINARIANS HAVE CONSTANTLY FACED CHANGES. Many adjustments have been made since the days when the profession was predominately horse practice. It is quite disconcerting when one hears a veterinarian make statements that other interests are supplanting veterinary services. In my book, if there are cases where this is true, we should do a lot of soul searching as to why veterinary services are being by-passed. I personally feel such statements are made following frustrating experiences that we all encounter at times and are not a true picture of the situation at all.

It is true that many allied interests, associated with livestock production, recognize the importance of disease and parasites, and how it may affect their particular program as it relates to animal production. I would like to ask where, in the field of breeding, feeding, management, housing, marketing, finance, that livestock health does not come into the picture?

If veterinarians would attend some of the meetings frequently held by those people working in allied areas, I am sure they would better understand why so much reference is made to disease. Disease is probably the most important reason why various animal production programs do not always meet with success.

Common Problem

Veterinarians, particularly in the hog belt, should be acquainted with current changes in the swine industry.

Breeding, selection, heritability, outbreeding, inbreeding, hybrid line and hybrid

Presented at the annual meeting of the Illinois State Veterinary Medical Association, 1959.

vigor — all of these factors are important in the development and improvement of swine that produce large litters, grow rapidly, use feed efficiently, hang up a meaty carcass and are resistant to disease.

Selection can be productive only when we select for those things that are highly heritable. We find selection an effective means of changing a type of hog. As an example, the meat type hog can be changed in a few generations by using boars with a high percentage of lean cuts and a minimum of backfat. This characteristic is 50 to 60% heritable. Rate of gain and feed efficiency will only be improved 15 to 20% through inheritance. The greater improvement comes from feeding, management and disease control. Production testing is taking place in most swine producing areas.

How much can a tested boar increase yearly income? The following observations based on one typical farm farrowing 80 litters a year is not without interest.

80 litters x 8 pigs per litter = 640
50c per cwt. on 225 lb. mkt. hog = 1. 12 x 640 = $717.00 + resale value for further breeding $175.00 = $892.00

Litter size and weaning weight are only slightly heritable. These two characteristics are best solved through crossbreeding — selecting those breeds predestined to produce large litters. Commercial hog producers follow a crossing program using two or more purebreds in rotation. The following crosses have proved most successful when high quality animals of each breed were chosen: Hampshire, Poland China, Duroc, Landrace, Poland China, Hampshire. The Yorkshire may be used to replace the Landrace; however, it is not recommended they both be used in the three-way cross.

Hybrid vigor is the term applied to the increase in performance that results when unrelated breeds or lines are crossed. There is little to be gained in hybrid vigor by using more than three breeds or lines.

Outbreeding or inbreeding finds little application in commercial hog production. For the most part, these are special breeding practices in purebred and college herds.

Fundamental Facts

The veterinarian's greatest concern with the breeding herd is the health and sanitation, management and feeding, even though proper selection of the breeding herd is of utmost importance. Proper selection cannot be made without proper identification. There are several good ear marking methods in use today, some of which not only identify the litter but pigs within a litter. This identification is equally important from a health standpoint as it is from an inheritance standpoint.

The more common diseases that should be considered as far as the brood sow herd is concerned can be broken down into three groups: pregestation, gestation and lactation. In the pregestation period (four to eight months of age), brucellosis, leptospirosis, rhinitis, bloody scours, pasteurellosis, jowl abscesses, PPLO, arthritis, influenza, tuberculosis, ascariasis, tumors, warts, hernias and ringworms must be considered.

In the gestation period, influenza, rhinitis, erysipelas, pox, mange, lice and sporadic abortions are of primary concern.

During lactation, hysteria, agalactia, mastitis, metritis, paralysis and lameness enter the clinical picture.

For the most up-to-date information on swine diseases, I would like to recommend the new book edited by Dr. Howard W. Dunne and published by the Iowa State College Press, *Diseases of Swine*. This book has 48 authoritative contributors, selected for their recognized leadership in this field.

Feeding and Nutrition

I would like to bring to your attention some of the more general aspects of feeding and nutrition as viewed by an extension veterinarian and former practitioner.

Veterinarians must be sound in their thinking and application of basic nutrition. Only after careful consideration of any immediate situation should a change be recommended in the ration being fed. At all times practitioners should thoroughly explain to clients why the ration should be changed and for how long. Unless this is done, the practitioner indirectly blames a ration for

reasons other than from a basic nutrition standpoint.

As an example, the frequent advisability of a temporary change in feed during enterotoxemia outbreaks. If we fail to explain why we are recommending the change, many owners may quote a veterinarian as saying certain feed has poisoned his pigs. If the owner is feeding a commercial feed or a locally mixed ration, ill feeling can be easily created, to say the least.

Practitioners should know the comparative nutritive values and costs of the energy feeds, proteins, vitamins, minerals. Publications are available for estimating feed substitution rates and determining economic efficiency in swine production both in drylot and pasture.

When can single source proteins be used and when should balanced proteins be recommended? Today we hear considerable discussion of least cost versus least time rations. We all should be completely familiar with these rations so that we can discuss them with our client so that he understands when and where he might best use one or the other. One client may lose money or hogs with one ration while another may use it successfully. Most clients can take advantage of least cost rations by farrowing one to three weeks earlier. Where are his best opportunities of reducing feed costs without impairing efficiency and rate of gain? Certainly not in young pigs up to 50 or 60 lb. Here we need the most exacting, highly fortified feeds available. If one has done a good job up to 60 lb. then costs can be cut by feeding free choice corn and supplement or corn, soybean oilmeal, and minerals. Also, through the use of pasture or corn silage properly supplemented cost of the sow ration can be reduced drastically without sacrificing quality. Many still over-condition their sows, which is a waste of feed. I know a large swine producer that cut his feed cost on his brood sow herd to the tune of $3,000 and still weaned nine-plus pigs per litter.

Management of feeding has and is being given greater attention since the increased use of confinement feeding: complete ground mixed feeds versus free choice, pelleted rations, size of feeders, method of fitting, rate of feed flow, feed wastage, feeder space per animal, feeder placement inside or outside of shelter area. These and possibly other factors often play a greater part in determining profit and loss than does the feed itself.

Salt Poisoning and Feed Additives

I cannot leave this part of my discussion without making reference to salt poisoning and feed additives. An extension veterinarian's work brings him into contact with many swine producers as well as veterinarians. Through such contacts it is my belief that by making so frequent reference to salt poisoning we have alerted our livestock producers to the point where many of them are afraid to feed enough salt. Why do we not take the time to explain under what conditions sodium chloride poisoning can occur?

Veterinarians can probably get into arguments more quickly over drug additives than over almost any other factor regarding nutrition and health of swine. I am sure the picture is becoming brighter in this regard, with much of the improvement due to clearer understanding as to where, when and why, and in what amounts antibiotics, arsenicals, and other additives can be expected to give the best results. Most of this trouble has been due to direct consumer advertising. Even feed companies are deeply concerned over this problem.

Management

Management practices have become much more important with the advent of more confinement rearing of swine. The use of pasture has and can alleviate considerably faulty management practices.

In confinement rearing of swine we must pay closer attention to numbers in a lot, area per animal, slope of the floors, methods of cleaning and manure handling, size, placement, filling our feeders and waterers; best cleaning and disinfecting methods between crops of hogs; location of farrowing nursery area in relation to growing-finishing area. How do we group our farrowing to keep units full? How long should each unit

remain idle between each crop of pigs? How many boars are needed? Is pen or lot breeding available, are replacement brood sows from fall or spring farrowing gilts? How long should sows be kept for breeding? When should I wean? Should the sows be bred first heat period after weaning? Should bred sows be kept on pasture or lot fed? What age to castrate, vaccinate, worm, spray for lice and mange? We could go on but what is the use? Veterinarians are and must be the most informed persons in agriculture. They must be walking encyclopedias, or at least have one handy.

Swine Housing and Equipment

It is in this area that research is just getting started. There are many plans and ideas available with only a few backed up by adequate research. Probably the best information I could recommend is to write to your own Agricultural Engineering Service or some other state in the Midwest. Also, much can be learned by observing setups that are working satisfactorily. These may be in your immediate area or within a reasonable distance.

Marketing

Needed information in this area can be obtained by being placed on the mailing lists of our marketing and processing plants, United States Livestock and Meat Board and USDA Marketing Service, State Crop and Livestock Reporting Service. Most certainly a veterinarian should know what a no. 1 carcass is and what kind of a live hog it takes to produce such a carcass. It is disconcerting to hear a veterinarian make a statement that "a hog is a hog" and that probing for back fat, rate of gain and feed efficiency is foolishness.

Finance

Veterinarians should not be expected to have any actual part in supplying needed capital or credit unless one wishes to work out some effective contract based on gross or net returns of the projects. It would be well, however, to supply information as to good sources of capital and credit, where quantity and advance purchase of supplies can be made to the best advantage, help analyze existing contracts available, feeds, breeding stock, marketing. We are hearing considerable about contract farming and integration today. We should all view them with open minds and explore their possibilities. Some contracts could prove to be quite useful while others could reduce our potential clients to the point where they are only hired help for some big commercial concern.

We are professional people working in the field of veterinary medicine, and the practice of veterinary medicine must include many related sciences.

As a partial answer to what we may consider to meet the challenge of changing conditions, I would like to submit the following: Change in curriculum at undergraduate level. There has been constant change in courses offered by our veterinary schools to meet the needs of the practice of veterinary medicine. Many deans of veterinary medicine have advisory committees to assist them in making possible changes. Our administrators have been faced with many problems, only one of which is courses offered, time and personnel to teach them.

In Iowa, we have attempted to help our practicing veterinarians by developing field refresher short courses on the latest information available on problems of current interest. These programs are developed and presented to district associations by the extension veterinarians. We find that including animal breeding people, nutritionists and entomologists on the programs is rewarding, not only for information, but for better public relationship between these groups and veterinarians. As many of you are aware, we have three extension veterinarians in Iowa on a full time basis. An ever increasing amount of their time is being devoted to educational programs directly associated with the practice of veterinary medicine.

It has been suggested state or district veterinary associations employ either on a partial or full time basis someone to abstract and compile condensed information from all research related reports.

Greater Extension of Group Practice

Too many of our practitioners are simply too busy, when working alone, to enable them to take advantage of existing opportunities to keep on top. Change is never ending, and changes have been occurring at such an accelerated pace the last few years that it is truly remarkable the way veterinarians have been able to keep up with these changes.

Group practice often permits specialization whereby one associate devotes the larger part of his time to swine practice or dairy, sheep, poultry. The need for simple laboratory procedures in diagnostic work by practitioners is being given more attention. Our clients are becoming more and more used to services in connection with things they purchase. They are paying for these services and will also pay for veterinary service aimed primarily at preventive medicine. They desire disease and parasite control plans and supervision, and I know they will pay for such services.

I would like to close with this thought. When at all possible, seek more information in allied fields. Demand and back more help from teaching, research and extension. Remember that when we stop getting better, we stop being good.

Legal Judo and the Medical Expert

Dr. Carl E. Wasmuth, staff anesthesiologist at the Cleveland Clinic and editor-in-chief of the Cleveland-Marshal Law Review, has some interesting pointers to offer the professional man who is called upon to testify in court. Writing in the February 25 issue of *Medical News*, Doctor Wasmut declares it simple to withstand the vicious attacks of opposing counsel on cross-examination. The following simple principles, once mastered, enable the witness to protect himself.

1. Give complete and honest direct testimony; it is the best assurance of a short, easy cross-examination.
2. Maintain an attitude of dignity and self-control. Do not become flustered or angered by searching or antagonistic questions.
3. Understand the question. After due consideration, answer slowly, honestly and concisely. Don't blurt out a quick (perhaps damaging) statement. At the same time, do not take too long, or the jury may gather the impression that you are not the expert your counsel has claimed.
4. Use simple terms. Avoid m e d i c a l phraseology not readily understandable to the jury.
5. Answer only the question asked.
6. Do not resort to sarcasm or innuendo. Demonstrate patience.

In many cases counsel will glean a statement from an authoritative book which, out of context, contradicts the expert's testimony. By merely reading such a statement into evidence, a shrewd counsel can overcome an expert's damaging testimony. The groundwork is laid by getting the expert to admit that a certain writer is *the* expert. The foundation question is similar to the following: "Doctor, are you familiar with Sturdley's text on shipping fever? Is he not a leading authority in the field?" An unqualified "yes" is damaging in the extreme, for it permits counsel to quote at liberty, often presenting damaging lines out of context. In short, the expert witness has discredited himself.

A doctor can turn the tables on a lawyer by answering such a question thus: "Yes, I have read Sturdley along with many other authorities on the subject. He is *just one* of the authorities."

Another point in the game of legal judo, Doctor Wasmuth goes on to say, is to know what your opponent is trying to do; lead him toward what he thinks he will get; and then give him the truth. Once a counsel commits himself, his own momentum will be his undoing.

Editorial

OPPORTUNITY for PROFESSIONAL GROWTH

Another major scientific advancement has cleared the ivory tower stage and is fast expanding as a practical service to the livestock industry. The disease-free pig project described in the accompanying article is not fantasy but the culmination of many long years of perseverance, methodical investigation and faith on the part of Dr. George Young. Based on field results to date, there is a rapidly growing demand on the part of leading swine raisers for scientifically produced disease-free stock. Rapid expansion of confinement feeding and highly efficient, large scale swine operations are multiplying disease problems which we have attempted to live with in the past. Disease-free stock is not just a pleasant possibility. The long-range success of accelerated swine feeding programs depends on elimination of the costly disease factor, and livestock owners investing heavily in such operations are demanding disease-free breeding stock. They will obtain it some place.

As a profession we are offered another gigantic opportunity to extend veterinary medical service. The delivery and supervision of disease-free pig projects is a logical professional service. We must accept this development now and invest in the facilities and know-how required, or watch another advancement of agriculture from the sidelines, as we have watched artificial insemination and poultry disease control.

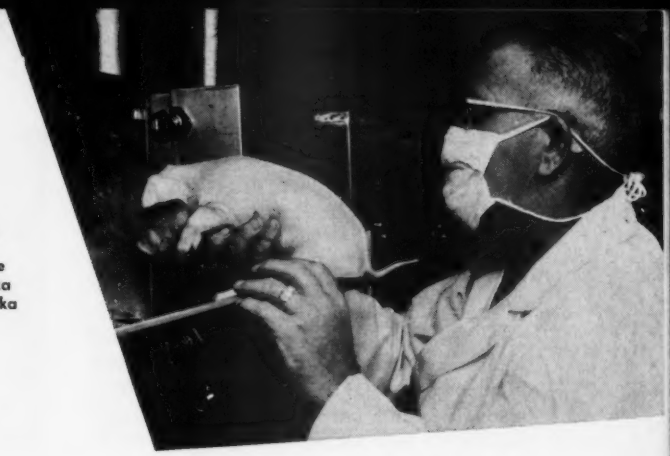
At present one Iowa veterinarian plans to offer a service for breeders which includes hysterectomy, early isolation of the pigs, and raising pigs to breeding age before returning them to the owner's farm. In this way, the farmer can stay in the hog business until about six weeks before restocking his farm with disease-free pigs.

A seminar has been held for about 30 eastern Nebraska veterinarians to acquaint them with this program. Doctor Young points out that we need to bring back to veterinary service those farmers who will tend to get along without it. One difficulty that has been encountered is the problem of re-educating ourselves to the critical requirements demanded for a successful disease-free program. In several instances cooperating farmers have had to provide boots and coveralls to veterinarians called for hog cholera vaccination. Veterinarians, feed salesmen, and other casual visitors to the hog lot can easily infect disease-free hogs.

Since we believe in the merits of private practice, the advantages of a professionally owned and operated swine maternity hospital with suitable isolation wards and a skilled staff, seemingly offers far greater challenge than supervision of numerous farmer owned facilities. With only modest dreaming, it appears that prompt aggressive action on the part of veterinarians in the next year or so could readily dot our rural areas with financially sound hospital facilities exceeding the standards now demanded by our small animal hospitals.

GEORGE A. YOUNG, D.V.M.

Department of Animal Pathology and Hygiene
University of Nebraska
Lincoln, Nebraska



Disease-Free Pigs

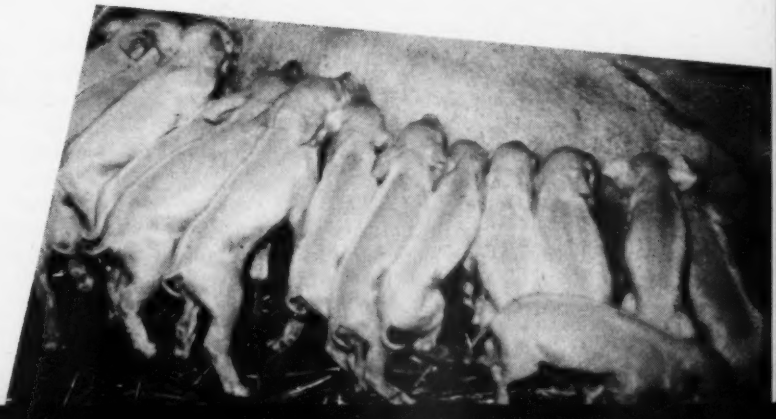
ANY livestockman who has raised pigs has learned to accept that 30 to 40% of pigs born alive never live to reach market weight. He also has learned that many of the animals that live need medication or treatment to become marketable hogs.

The challenge to the researcher has been to devise methods to control these diseases.

Two years ago a Nebraska Experiment Station project was started to meet this challenge. Progress has been made with a bold approach to control swine diseases.

Nature has provided tools by which we can obtain disease-free pigs from gilts and sows, even though they come from diseased herds. The pig at birth is free of disease. It lacks, however, the antibodies or the protective substances which it needs to survive in a natural environment, and normally depends upon colostrum to sup-

This report was first presented in the Nebraska Experiment Station Quarterly, 5:3, 1958.



ply them. It can survive without colostrum provided it is placed for the first weeks of its life in an environment that will protect it from disease organisms.

Materials and Methods

Disease-free pigs are obtained by hysterectomy from two to four days before they would be farrowed normally. The sow is hoisted by her hind legs and lowered head first into barrel containing a small amount of dry ice. The dry ice turns to carbon dioxide gas for anesthesia. The gravid uterus is removed and passed through an antiseptic lock into an enclosed hood (see illustrations).

Pigs are quickly torn out of the uterus so they may breathe. Air in the hood has been filtered. Pigs are then transferred under cover to special brooders and fed a modified cow's milk. After four weeks they are adapted to farm-type management. The sow is processed for food.

The method used to get disease-free pigs requires special equipment, skilled personnel, and the number of pigs which can be raised is small. However, investigators believe that these methods may be used effectively to control and eradicate swine disease in a practical manner. The approach is as follows:

1. *Obtain Disease-Free Pigs.* These are obtained from good breeding stock by hysterectomy and handled as described.

2. *Rear Pigs in Isolation.* Pigs are housed in individual isolation units until one week of age. During this period they are fed cow's milk modified by addition of egg, vitamins, and mineral. From one week until four weeks of age they are housed in groups of 8 to 12 in isolation brooders. There they learn to eat solid feed and drink water.

3. *Mature on Farms.* Pigs reared in isolation until four weeks of age are placed in groups of 10 to 20 on farms from which all other swine have been removed. Ordinary rearing methods are employed except that no new so-called "normal" stock is introduced and contact with other swine must be avoided by the farmer.

4. *Resume Normal Birth.* The stock which was reared to maturity on farms is kept there and used as brood stock. Normal birth is resumed. Precautions are taken to avoid introduction of disease. These precautions need not be elaborate and are based primarily on sound management practices.

Disease-free Yorkshire-Hampshire crossbred barrows farrowed and reared on concrete. Average weight of 58 barrows at 154 days was 219 lb. Precautions were taken to avoid introduction of disease from other farms.

5. *Restock Other Farms.* The clean stock obtained on primary farms by steps 1 to 4 is used to repopulate other farms. These considerations for disease control are observed: (a) no other swine on the premises; (b) mechanical cleansing and disinfection of premises based largely on a period of 4 to 6 weeks with no hogs on the premises; (c) introduction of stock only from farms which are on the same program or from the central laboratory; (d) avoidance of direct or indirect contact with other swine. Indirect contact includes traffic in and out of the herd by persons who may visit other swine herds, for example, feed salesmen and livestock buyers.

Program is Required

That there is need for such a disease control program is illustrated by considering two swine diseases identified in recent years as important causes of "poor-doers." These diseases are atrophic rhinitis and virus pneumonia of pigs.

Once a pig has AR it may be a continual carrier of the disease, although outwardly it may appear normal. AR is commonly in-

troduced with the addition of "normal" appearing but diseased carrier stock. There is no test available to detect AR carriers. About 10% of the swine herds in this country are infected with AR. The disease, on a herd basis, causes swine to become about 5% less efficient.

Lungs of pigs with VPP may harbor the organisms for over a year. Thus VPP also is a disease spread by carrier animals. There is no test to assure the livestock buyer that the stock he purchases is free of VPP. This disease is estimated to afflict half of the herds in the United States. VPP causes swine, herdwise, to be about 20% less efficient.

The best solution for either AR or VPP is to sell all stock and start over with new pigs free of these diseases. This is difficult to do with 10% of the swine herds infected with AR and 50% infected with VPP. Pigs raised as outlined in the new Nebraska project do not have AR or VPP. Stocks from these herds, therefore, can be used to repopulate farms on which AR or VPP has occurred.

How well the method can work is evident by results obtained on four Nebraska farms. Two of these farms received pigs from the laboratory. The pigs were raised to maturity. Part of the mature stock from each of these farms was placed on the third and fourth farms. The findings:

Farm A: 15 disease-free gilts and four boars were raised on this farm. They averaged 213 lb. at 154 days even though the early part of their lives was spent in brooders. Ten of these gilts were kept on farm A and farrowed 123 pigs in modified horse stalls. Only ten pigs died from all causes the first 56 days. Average 56 day weight was 43 lb. One ruptured pig died after weaning. Average weight at 154 days was 212 lb. Seven litters out of ten weighed over a ton. Two of them weighed a ton and a half. The pigs were Yorkshire-Hampshire crosses. All hogs were raised on concrete.

Farm B: Five bred gilts from farm A were used to stock farm B. These gilts farrowed 49 pigs. Average weight at 56 days for 45 pigs was 50 lb. No pigs died after weaning and the average 154 day weight was 210 lb. Three of the five litters weighed over a ton. These pigs were also raised on concrete.

Farm C: 12 disease-free gilts and four boars delivered by hysterectomy and raised to four weeks in the laboratory were raised to maturity on this farm. The primary stock averaged 188 lb. at 154 days with some very marked breed differences. Six of the gilts were retained on this farm and farrowed 83 pigs. Of these, 68 were weaned and averaged 49 lb. at 56 days. The average 154 day weight was 232 lb. All of the six litters weighed over a ton. Pigs were Hampshire-Yorkshire crosses except those from one litter which were pure-bred York and another which were Hampshire-Berkshire crosses.

Farm D: Five of the 12 gilts raised to maturity on farm C were used to repopulate farm D. These gilts farrowed 50 pigs and weaned 45 of them with an average 56 day weight of 48 lb. No other pigs were lost and the 154 day average weight was 211 lb. Pigs were Hampshire-Berkshire crosses and were raised on pasture from shortly after birth to 154 days.

Summary and Plans

In summary: 26 gilts farrowed 305 (11.7 average) pigs and weaned 271 (10.4 average) at 46 lb. (56 days) with 154 day weights of 212 lb. Litters over a ton numbered 13 and two litters weighed over 1½ tons at 154 days. Loss from all causes was only 11% as compared to the usual 30-40% experienced on farms throughout the cornbelt. Examination of the snouts and lungs of barrows at slaughter showed no evidence of atrophic rhinitis, virus pneumonia or any other disease common to swine.

Future plans for this program include use of stock farrowed by these 26 gilts to repopulate other farms and continued observance of pigs within the four herds described above. The program has now been extended to 11 farms. Although repopulation holds much promise as a major disease control measure, there will be some limitations. It is important that any limitations be discovered as soon as possible to enable an early and practical application of the method to disease problems common to swine raised on Nebraska farms.

Control of

Preparturient udder congestion as shown above is a common problem which threatens future production and udder health.

Congested udder at right responded promptly to one of several new drugs on trial.

A MEANS OF CONTROLLING physiological parturient edema and congestion of the udder in dairy cattle has become increasingly important and desirable in the dairy industry. Therapeutic measures for reducing the edema have been employed, but none in the past has proved generally effective.[4,6] These have included massage, use of hot compresses, udder ointments and liniments, preparturient milking and restriction of protein-rich feeds. The excessive restriction of ration intake, especially after calving, may result in acetonemia.[6]

High-producing dairy cattle and cows in good physical condition are more subject to edematous conditions prior to and after parturition.[7] In some cases the congestion may be due to an infection, but in many cases it is a natural sequela to the rapid development of the udder for milk production.[5,6,7] Constant negative pressure of the magnitude used in milking machines when applied to the teat overlong will cause

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# of Udder Edema in Dairy Cows

Clinical Evaluation of Acetazolamide Sodium

H. E. GOUGE, D.V.M., A. L. SHOR, D.V.M., and W. P. JOHNSON, D.V.M.

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the teat to become edematous and congested.[1]

In severe cases of parturient edema, the swelling may predispose the cow to mastitis and permanently damage the udder and its attachments. A preventive program of preparturient milking has been demonstrated to be the most satisfactory answer for controlling edema and congestion of the udder.[4,7] This process not only makes milking easier, but it is a factor in preventing undue swelling and breakdown of the udder. The disadvantage of preparturient milking is that following freshening there is little or no colostrum for the newborn calf.

It seems essential to study the problems and therapy of edema and congestion of the udder in order to evaluate its economic importance. The fact that the economic importance is not established is because (a) the conditions cannot be controlled satisfactorily; (b) they are considered to be natural sequelae of parturition; (c) the number of cows completely free of edema and congestion of the udder are few; (d) there are at present no specific prophylactic measures for treating these conditions.[4,6]

Recently, attention has been given to a nonmercurial diuretic as a new approach to the treatment of edema. Favorable results[2,3,8,9] were obtained by early workers who used acetazolamide as a successful treatment for edematous conditions in humans. This compound eliminates fluid without need for mercurials or other diuretics. Acetazolamide, a potent carbonic anhydrase inhibitor with low toxicity and lack of renal and gastro-intestinal irritation has been found to cause a copious diuresis of sodium, potassium, bicarbonate and water. The mechanism of action is that of blocking the formation of H_2CO_3 in the renal tubules, thus keeping the blood electrolyte changes to a minimum. When carbonic anhydrase activity is inhibited by acetazolamide the excess amounts of base cations and bicarbonate ions are excreted along with copious amounts of water. Under these conditions, the edema disappears.

Clinical investigations were started in

January 1955, to determine the efficacy of the compound in dairy cattle diseases. Results from these trials show that acetazolamide is a successful treatment of preparturient and postparturient edema of the udder.

Materials and Methods

Sodium acetazolamide (Vetamox—American Cyanamid) in the form of a soluble powder for feed or water medication, 1 gm. Oblets (American Cyanamid) and a parenteral solution, was distributed to 12 veterinarians whose practices represented a fair cross-section of dairy cattle practice in seven states. Suggested dosages for the investigations were 2 gm. b.i.d. for the soluble powder or Oblets and 500 mg. of the parenteral solution for intramuscular or intravenous administration. Parenteral administration was followed by a maintenance dosage of 2 gm. b.i.d. of the powder or Oblets. Clinical evaluations were made on each cow treated. Acetazolamide sodium was the only treatment administered.

Results and Discussion

For this study, a total of 82 cattle with parturient physiological udder edema was treated with dosages of acetazolamide ranging from 1 gm. b.i.d. to 2 gm. t.i.d. for periods of one to six days. Improvement was reported in 74 cases (90.2%) and 58 of the 82 cases (70.7%) completely recovered (table 1). Of these cases, 38 were given a 500 mg. treatment of the parenteral solution as the only treatment or for their initial treatment. All cows treated by this route of administration showed improvement following treatment and 29 cows (76.3%) completely recovered. Of the 38 cases, there were 11 cases of preparturient udder edema, and 27 cows with postparturient physiological udder edema (table 2).

Days required for improvement or recovery were reported for 27 cases. Within one day 52% of the cows improved and 44% recovered. Only 14.8% required over three days of treatment for improvement.

The oral route of administration of acetazolamide was used in 37 cases diagnosed as postparturient physiological udder edema and resulted in improvement in 33 (89.2%) of which 26 of the 37 cases (70.7%) completely recovered. Improvement was observed in 51.5% of the cases within one day and in 84.9% within three days for the 33 cases that showed improvement. Recovery was observed in 3 (42.8%) of the 7 cases of preparturient physiological udder edema and improvement in 3 additional cows was observed within three days following the start of treatment.

The rapidity of the effect of treatment would indicate that recovery did not occur by chance as the time normally required is several weeks.[4] Some of the failures observed may have been due to an infection associated with the edema. Since acetazolamide does not have antibacterial activity, conjunctive treatment with an antibiotic might have increased the percentage of responses.

Studies made by many investigators suggest that the use of acetazolamide reduced the pain of edema more rapidly than usual. The drug resulted in "letdown" of the milk in some cases following the unsuccessful use of oxytocin. Failure of "letdown" of milk which is observed occasionally after parturition in young dairy cattle can cause udder edema and congestion.

The prevention of damage to the udder

TABLE 1. Results of Different Routes of Administration of Acetazolamide for the Treatment of Bovine Physiological Udder Edema

Route of Administration	Total Cases	Recoveries	%	Improvement	%	No Response	%
I.V. or I.M. initially (followed by oral administration)	38	*29/38	(76.3)	38/38	(100.0)	0/38	(0.0)
Oral	44	29/44	(65.9)	36/44	(81.8)	8/44	(18.2)
Total treated	82	58/82	(70.7)	74/82	(90.2)	8/82	(9.8)

*Number recovering or improving/total treated.

was attributed to acetazolamide by some investigators. There was no indication of toxicity in the 82 cases and milk production was not influenced by the addition of acetazolamide to the feed. However, some investigators reported a mild, transient diarrhea that stopped when the dosage was reduced. Some investigators were of the opinion that even more favorable effects of the elimination of body fluids were attained when diarrhea occurred.

Reports from several investigators revealed successful results from the use of a 2 gm. b.i.d. dose of acetazolamide in the treatment of six cattle affected with urinary calculi, 27 of 30 (90%) cattle with retained placentas and recovery of one downer cow.

A dose of 2 gm. b.i.d., or less of the oral preparation was used in 36 of the 44 cases given oral treatment and improvement and/or recoveries did not appear to be increased when a larger dose was used. The dose producing the most consistent results was 2 gm. b.i.d.

Summary

Data from 82 cases of preparturient and postparturient physiological udder edema in which Vetamox acetazolamide was used for treatment are summarized. A review of these reports shows improvement in 90.2% and recoveries in 70.7% of all cows which were treated. Within two days of the start of the treatment 61.1% of the treated animals completely recovered. There were no significant ill effects except a mild transitory diarrhea.

Two gm. b.i.d. of acetazolamide which was used in 75% of the cases proved to be the most consistently effective dosage for the treatment of physiological udder edema in dairy cows.

Limited data on the use of acetazolamide for the treatment of urinary calculi and retained placenta were included.

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TABLE 2. Summary of Results of Different Routes of Administration of Acetazolamide for the Treatment of Preparturient and Postparturient Physiological Edema

Route of Administration	Diagnosis	Total Cases	Recovery	%	Improvement	%	No Response	%
I.V. or I.M.	Postparturient udder edema	27	*25/27	(92.6)	27/27	(100.0)	0/27	(0.0)
I.V. or I.M.	Preparturient udder edema	11	4/11	(36.4)	11/11	(100.0)	0/11	(0.0)
Oral	Postparturient udder edema	37	26/37	(70.2)	33/37	(89.2)	4/37	(10.8)
Oral	Preparturient udder edema	7	3/7	(42.8)	3/7	(42.8)	4/7	(57.1)
Total treated		82	58/82	(70.7)	74/82	(90.2)	8/82	(9.8)

*Number recovering or improving/total treated.

An Unusual Case of Anaphylaxis In a Pony

R. L. LUNDVALL, D.V.M., M.S.

OCCASIONAL ALARMING REACTIONS have been reported following administration of certain of the tranquilizing drugs. The following is a report of an apparent true anaphylactic reaction resulting from the intravenous injection of promazine hydrochloride (Sparine — Wyeth Laboratories).

Case No. 06006

Female Shetland pony, ten years of age; weight approximately 300 lb.; seven months pregnant, and in fairly good condition. The patient was referred to the Stange Memorial Clinic at Iowa State College on December 16, 1958 for treatment of a compound comminuted fracture of the left metatarsus.

Upon admission to the clinic the animal was examined and 150 mg. of Sparine injected intravenously. This was followed in 15 minutes by 75 cc. Equitol (Allied Laboratories). Good surgical anesthesia was produced. The fracture was reduced and a plaster-of-paris cast applied to the leg, extending from the hoof to eight inches above the hock. Induction and recovery from anesthesia was smooth; the animal regained its feet within 1½ hours. Sparine was again administered intravenously on January 6, 1959 (250 mg.) to quiet the animal so that several windows could be cut in the cast. Optimal tranquilization resulted, and no undesirable reactions were noted.

On January 20, 1959 it was decided to split the cast to dress the wounds incurred at the time of the fracture. It was planned to inject 200 mg. Sparine intravenously. When approximately 100 mg. had been administered, the animal suddenly reared back against the halter rope. Respirations became very stertorous, violent muscular trembling was observed, pupils became widely dilated, and edema of the glottis was thought to be present. Injection of Sparine was stopped.

The animal was kept on its feet by its weight pulling back against the halter rope. Within the next minute respiratory exchange almost stopped, and auscultation over the chest revealed that the heart rate was approximately 150 per minute, and very moist, bubbly rales could be detected. The pulse became almost imperceptible. Within five minutes from the onset of the symptoms,

respirations became more regular, slower, and less noisy. Heart rate slowed to about 60 per minute and the pulse became stronger. The animal began to sweat profusely as the more acute symptoms subsided.

Muscular trembling continued for approximately 15 minutes longer. The animal appeared normal 1½ hours after the reaction occurred.

Sparine had been used as a tranquilizing and as a preanesthetic agent in more than 600 horses prior to its use in this animal. No alarming symptoms had occurred in this series of animals, though an occasional animal would sweat following intravenous administration, and a few animals (less than 2%) were not quieted by the administration of the drug.

Reactions to Phenothiazine Derivatives

Several other phenothiazine derivatives have been used as tranquilizing agents in the various species of animals. In the horse, with the exception of Sparine, a certain percentage of animals will become hyperexcitable following injection of the phenothiazine derivatives. The animals will show poor muscular coordination, alternate periods of depression and excitability, intermittent trembling, and profuse sweating. Commonly, the animal will lower the head between the forelegs and appear to be in a stupor, then suddenly lunge forward. This is repeated over and over again for several hours, and may continue until the death of the animal. Usually, seizures gradually become less violent and the animal returns to normal after several hours. This type of reaction has been termed a "parkinsonian seizure," however, this term cannot properly be applied.

The reaction occurring in the animal reported was apparently a true anaphylactic reaction. It is theorized that the animal became sensitized to the drug, or possibly to the diluent, from previous injections. Recovery was spontaneous and complete within a short time, though the heart rate did not return to normal for approximately 30 minutes.

Diseases of Newborn Pigs

The time of year is already here in many sections of the United States when veterinarians are called upon to diagnose the death *in utero*, or death or at least serious evidences of illness in piglets. The conditions most frequently are either, (1) anemia of suckling pigs, or (2) hemolytic disease of newborn pigs.

Anemia of suckling pigs, a deficiency disease, is well understood and handled with pieces of sod, painting the sows mammae, or other methods of administering iron compounds.

Hemolytic disease of newborn pigs is not nearly so general as anemia of suckling pigs, although almost always fatal. This condition—similar to jaundice or icterus of frals—is the result of mating serologically incompatible parents. The sow acquires antigen from the boar so that she develops antibodies. In rare cases of placental permeability, unborn pigs acquire antibodies which destroy red blood cells, and death in the uterus and of course death at birth is the result. More frequently, antibodies are in the sow's colostrum. Pigs born in normal good health get the antibodies at their first nursing, presumably to be absorbed into the blood stream from its digestive tract, so that there is rapid erythrocyte destruction, and death in less than 60 hours with symptoms of profound anemia and varying degrees of icterus.

If this breeding line is to be preserved, dead pigs may be expected; or if the pigs appear normal at birth they must immediately be placed with foster mother, or fed artificially. Destructive antibodies in the sow are usually permanent. In the case of icteric frals, the ability to absorb antibodies through the digestive tract is overcome after 48 hours, after which piglets may be returned to their dam for nursing.—*R. R. Dykstra, D.V.M.*

Here each month are published ideas, suggestions and comments picked up by VM reporters at veterinary meetings.

The Meeting Circuit

Confinement Raising

CONFINEMENT RAISING of swine tends to accentuate basic problems of sanitation. A rapid build up of bacterial flora in a small area is probably a greater problem than the potential hazard of visitors walking through the lots. Exercise may not be too important, but some animals raised in confinement have to be carried on the truck. Several days walking around the yards is required before buyers are willing to bid. Tail biting can become quite a problem, since confined swine have nothing to do. Letting them run on pasture for a day seems to correct the condition. A couple of old tires thrown in the pens also gives them something to work on. Symptoms of vitamin D and calcium deficiency can be observed in fast growing pigs on a complete ration. Supplementation through the critical period seems to straighten them out in good shape.—*Dr. G. W. Gregory, Illinois State Meeting.*

Sources of Leptospirosis Infection

LEPTOSPIROSIS, due to a variety of serotypes, with animals as the source of infection, is critically discussed by Mrs. Galton, Communicable Disease Center, Public Health Service, in the February 1959 Public Health Reports. Her article is principally one dealing with sources of human infection, since the disease in human beings in the United States is on the increase. Cattle, swine, sheep, horses, goats and dogs, as well as such rodents as rats and mice, also raccoons are apparently all infection carriers, contaminating almost everything contacted with their urine.

In human males, more than half of the cases reported were between the ages of 15 and 30. Almost all were infected because of occupational and environmental factors. Ailing infected animals and carriers or shedders were involved.

Infection may take place from spattered urine of the usual domestic animals, from the handling of an infected pet dog, or the tissues of infected animals in abattoirs. Moist soil, swimming in contaminated stagnant pools or sluggish streams, or working in areas that are contaminated with urinary discharges, all are sources of infection.

Infection in man may take place through skin abrasion, and through the mucous membranes of the conjunctiva, nose and mouth. However the pH of the stomach appears destructive to the organisms.

Though the organism has been isolated from infected cow's milk, it seems that whole milk is leptospirocidal. There are no records of human infection contracted from this source.—*R. R. Dykstra, D.V.M.*

Antibiotics Re-evaluated

IN A STATEMENT described as a "re-evaluation of the use of antibiotics in swine nutrition" Dr. Damon V. Catron, Iowa State College swine nutritionist, recently presented a set of recommendations for

antibiotic feeding during the different stages of the life cycle of swine.

He suggests that "growth-permitting" antibiotics be used "only during the stages of the life cycle where they are needed."

"We also believe that it would be wise to rotate the use of these growth-permitting antibiotics and also to include an effective antifungal antibiotic, such as Mycostatin, especially during the stages of the life cycle where high levels of either a broad spectrum or a combination of antibiotics are being fed," he said.

"A careful study of the results of antibiotic feeding to swine over the past ten years indicates that there appears to have been a gradual decrease in response in gains and feed efficiency in growing and finishing.

"Reports from the field indicate an increase in mycotic enteritis in swine. This occurs when high levels of broad spectrum antibiotics or high levels of combinations of antibiotics are continuously fed for a considerable length of time.

"Based upon the experimental work to date, it appears that the following recommendations for antibiotic feeding of swine during the different stages of the life cycle can be made:

"(1) The established growth permitting antibiotics of choice are Aureomycin, Terramycin, penicillin and combinations of bacitracin-penicillin and streptomycin-penicillin.

"(2) The recommended levels of feeding for the different stages of the life cycle are as follows (grams per ton): Pre-gestation, 0; gestation, 0; farrowing, 50-100; lactation, 50 to 100; pre-starter, 100; starter, 100; grower (25 to 50 lb.), 50; growing-finishing (50 to 200 lb.), 0 to 20 (depending on disease level).

"(3) Present experimental evidence indicates the desirability of rotating antibiotics of different spectrum from one stage of the life cycle to another during the life cycle.

"(4) An absorbable antibiotic should be fed during the farrowing and lactation stages in order to give rise to a blood level thence a milk level for the baby pigs so that they may get antibiotic protection via the milk before they start to eat solid feed containing an effective antibiotic.

"(5) Evidence indicates the desirability of adding an effective antifungal antibiotic, such as Mycostatin, whenever high levels of broad spectrum antibiotics or combinations of antibiotics are continuously fed.

"We will no doubt have to depend on effective 'growth-permitting' and anti-fungal antibiotics for many years in order to maintain efficient, profitable swine production under most farm conditions. Research over the past decade has shown us how to use them most effectively." — *Feedstuff, February 14, 1959.*

Equine Diagnostic Problem

In the last issue of VM, we reviewed a knotty diagnostic problem submitted by Dr. John Turlington of Melfa, Virginia. He personally owns a valuable yearling harness horse. Since the dam gave little milk, the yearling was taught to eat and drink at an early age.

It is impossible to give it much water since it produces diarrhea. There is no way to satisfy the animal's thirst for water. Appetite is good and the yearling feels well. This animal never eats salt except when put in the feed.

Dr. Maurice W. Hale, Tifton, Georgia writes that he would not attempt a diagnosis on the information presented. He wonders if blood and urine analysis are in the normal range, also if intestinal parasites have been eliminated.

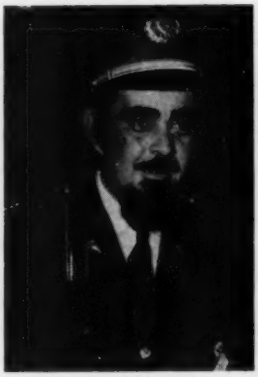
The following suggestion is offered to correct the polydipsia: provide a liberal ration of U. S. no. 2 white or red oats and U. S. no. 2 Timothy or upland prairie hay. The important part of the treatment consists of regular and daily work, including Sunday and holidays, with a long line or long reins. Exercise periods should be increased daily until the colt is able to withstand two hours of slow work, morning and afternoon. No fast work should be demanded for at least six weeks.

Improvement should be apparent within four weeks. The rationale is not easy to explain, but it has worked in similar cases in the past.

If you have comments on this case or a knotty diagnostic problem of your own, write VM. Problems or comments used will earn a year's subscription to VM.

REPORT FROM SPAIN

Bull fight at Madrid.



Cuban veterinarian with a Castro-type beard in fullest flower.

Professor V. S. Ersov (left) U.S.S.R., presented plenary paper on Immunity Against Helminths. Dr. Sellers, England, Animal Health Trust, is seated on the right.

A WORLD VETERINARY ASSOCIATION, with the next meeting to be held in Hannover, West Germany in 1963 was decided at Madrid last month, when the International Veterinary Congress convened with an attendance of 2,000.

Resolutions were passed asking governments to realize the increased danger of disease spread due to air travel, investigate air pollution, and study and standardize blood groups of animal species.

Dean Hagan will be United States representative of the new World Veterinary Association.

Dr. Kurt Wegener, Hannover, presided at the plenary session.

THE FUNCTIONS OF VETERINARY SCIENCE IN SOCIETY, *Dr. William A. Hagan, New York State Veterinary College, Ithaca, New York.*

The greatest and most important function of the veterinary profession in soceity is its essential role in maintaining a food supply, adequate in both quantity and quality, for mankind. The world's population is steadily increasing but its productive soils are not. Despite this man is better fed today, in the enlightened parts of the world, than ever before. This has been accomplished by science which has enormously increased production efficiency. The great increases in food production capacity would have been of no avail, had not disease, the enemy of production, been brought under control. In eradicating or controlling the diseases and parasites which prey on food-producing animals, the veterinary profession has served, and continues to serve, mankind. In this work the destiny of the profession lies.

Less important, but still a major contribution to society, is the service provided by the veterinary profession to man in protecting him from a host of diseases which are transmissible from animals. As these diseases are brought under control or eliminated in animals, hazards are correspondingly reduced for man.

ADVANCES IN BONE AND JOINT SURGERY IN LARGE ANIMALS, *Dr. Jacques Jenny, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pennsylvania.*

Modern veterinary surgery has progressed an important step. We have proved that after articular surgery horses can resume a successful racing career. We possess the necessary armamentarium to repair long bone fractures with few exceptions and are encouraged in this endeavor by successful case reports from different countries.

It is not possible to predict success or failure of a fixation technic as a result of experimental investigations or comparisons with similar type fractures in small animals or human beings. Only a period of trial and error similar to the one small animal and human surgery has gone through can establish a standard fracture treatment for large animals wherein the outcome of a particular case can be predicted. With proper first aid treatment, the shooting of equine patients with fractures for humane reasons is no longer justified.

An entirely new approach from the insurance underwriters toward fracture patients seems imperative. Bone and joint injuries ended a racing career as a matter of course a few years ago. Today, similar cases need not necessarily result in euthanasia; in fact such horses have at times continued racing. Until we have established accurate indications and contraindications for treatment of various fractures, many an attempted repair may prove futile. But if at first only one out of 50 cases can be successfully completed, the 49 failures will have enriched our experiences. It would seem logical for the insurance underwriters to study this problem since they own the animals which are frequently destroyed for humane reasons.

DIVIDING THE TASK OF VETERINARY PRACTICE BETWEEN QUALIFIED VETERINARIANS AND NON-QUALIFIED PERSONS, *Prof. Dr. Jac. Jansen, Utrecht, The Netherlands.*

When surveying the various phases of veterinary science and practice, it is evident that the difficulty of these activities differs greatly. To examine a patient requires great skill and knowledge. The veterinarian has to make the diagnosis and select proper therapeutic measures. The simple and harmless application of many killed or inactivated vaccines serves as a contrast.

History has shown that veterinary science and practice have to be exercised by trained, licensed veterinarians; but it appears that non-licensed persons are inclined to work in different fields of veterinary practice. The

division of tasks between licensed veterinarians and non-qualified persons is not clear and varies greatly in different countries. A study of the problem on an international plane is suggested to afford greater uniformity and protect the scientific level of the profession. The author asks if it is not desirable that all trained licensed assistants be under strict supervision of qualified veterinarians.

PATHOGENIC COLI'S IN VETERINARY PATHOLOGY, *L. M. G. Geurden, State University, Ghent, Belgium.*

Three pathological coliform processes are recognized in which pathogenic organisms are involved: diarrhea in calves and other young animals; edema disease in pigs; coligranulomatosis in poultry. In each of these processes different serotypes may be found and a same serotype may be present in many processes. Although in some processes (diarrhea) endotoxin of pathogenic coliform organisms may play an important role, different stress factors and immunological conditions appear to exert a major influence.

METABOLISM DISTURBANCES IN HIGHLY PRODUCTIVE COWS
Professor A. A. Kudryavtsev, Chief of Physiology, Laboratory of the All Union Institute of Experimental Veterinary Medicine, U.S.S.R.

According to A. A. Kudryavtsev, V. I. Zaytsev, A. P. Voloskova, S. G. Molchanov, K. I. Vertinsky *et al.*, the main cause of acetonemia is disturbed protein metabolism. This disturbance of protein metabolism leads to other pathological manifestations. It should therefore be termed a protein autointoxication.

Rare occurrence of the disease in intensively lactating cows during World War II, when feed was poor, confirms the fact that the disease can be chiefly attributed to over-feeding with rations rich in protein.

The onset of protein autointoxication is influenced not only by abundant or insufficient protein in ration, but also by alterations in body metabolism such as pregnancy, parturition and lactation. For this reason alterations in feeding may become responsible for protein, carbohydrate and fatty disturbances of metabolism that inevitably lead in some degree to clinical manifestation of the disease.

A great volume of protein ingested while the quantity of hay, succulent feeds and especially feeds rich in carbohydrates is limited, inhibits the activity of the rumen microflora.

With disturbances of normal digestive processes in the forestomachs, there appear inflammatory alterations of mucous membrane in the intestine and this allows toxic products to penetrate into the blood. In addition, protein and the products of its disintegration are not completely assimilated by the body. These products of protein disintegration pervading the body, change internal metabolism and normal functioning of vitally important organs resulting in disturbances of physiological conditions.

Lowered utilization of vitamins leads to endogenic avitaminosis. Alteration of protein and carbohydrate metabolism inevitably gives rise to fatty metabolic disturbances and to intensive formation of ketone bodies and hypercholesterinemia.

Appearing in the process of intensive fat disintegration, some compounds complementing the existing ones formed in the process of disintegration of proteins, deplete alkaline reserves of the blood leading to acidosis.

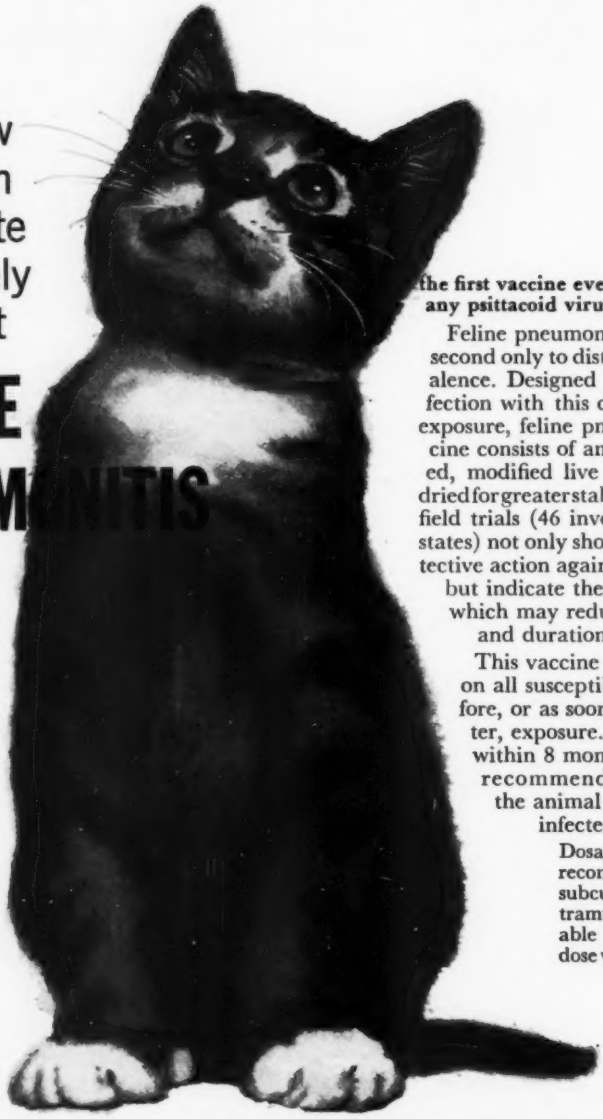
The products of incomplete disintegration of protein, ketone bodies and others when not sufficiently removed from the body cause gradual poisoning and degeneration of parenchymatous organs and functional alteration of the nervous system.

As a result of functional disorders there appears a disturbance of mineral metabolism, especially calcium and phosphorus. The needs of lactation when the ability to utilize these elements is impaired leads to depletion of skeletal calcium and the development of osteomalacia.

SMALL ANIMAL PRACTICE

now you can vaccinate effectively against

FELINE PNEUMONITIS



the first vaccine ever developed for any psittacoid virus disease

Feline pneumonitis is a disease second only to distemper in prevalence. Designed to prevent infection with this disease prior to exposure, feline pneumonitis vaccine consists of an egg-propagated, modified live virus, vacuum dried for greater stability. Extensive field trials (46 investigators in 13 states) not only show a highly protective action against pneumonitis but indicate therapeutic effects which may reduce the severity and duration of the disease.

This vaccine should be used on all susceptible animals before, or as soon as possible after, exposure. Revaccination within 8 months to a year is recommended whenever the animal is placed in an infected environment.

Dosage is 1 cc. of the reconstituted vaccine, subcutaneously or intramuscularly. Available in 1 or 5 single dose vials with diluent.

(Bio. 804)

extensive field trials show 86% of cats protected by vaccine				therapeutic effects also indicated			
No. of cats	Status	No. of cats remaining well	No. of cats developing symptoms	No. of cats	Status	No. of cats recovering in 5 days	No. of cats remaining sick after 5 days
1462	vaccinated	1254 (86%)	208 (14%)	611	treated	449 (74%)	162 (26%)
809	controls	483 (60%)	326 (40%)	379	controls	66 (17%)	313 (83%)
field use in noninfected cats				field use in infected cats			

PITMAN-MOORE COMPANY Division, **ALLIED LABORATORIES, INC.**, Indianapolis, Indiana

BACTERIOLOGICAL STUDIES OF WILD ANIMALS

Study of 90 wild animals trapped by public health investigators yielded 19 isolations of pathogenic organisms. Relationship of five raccoon cultures to human group G Streptococcus infection suggest a possible public health relationship.

NELL HIRSCHBERG, Ph.D., ROBERT MENGES, D.V.M., MARTIN P. HINES, D.V.M. and MILDRED GALTON, M.S.

North Carolina State Board of Health
Communicable Disease Center
Raleigh, North Carolina
and Chamblee, Georgia

DURING A STUDY on isolation of leptospires from bladder urine and kidney tissue of presumably normal wild animals, which will be reported elsewhere, some interesting cultural studies were made.

One of the wild animals used in making bacteriological studies.

The animals were trapped in North Carolina by personnel of the North Carolina State Board of Health and other public agencies, and transported to the laboratory alive. Two veterinarians and a bacteriologist handled the animals.

Materials and Methods

The animals were anesthetized lightly and bled from the heart for serologic studies. They were then killed with ether and immersed in 10% liquor cresolis saponatus for 15 minutes. The abdominal skin of each animal was opened with sterile instruments. Another set of instruments was used to open the peritoneum and remove the viscera.

The bladder was punctured and urine was withdrawn with a sterile dry 2 ml. disposable syringe and a ¾ in. 25 gauge needle. Three drops of urine were inoculated imediately into each of three tubes

of Fletcher's semi-solid medium.

Portions of both kidneys were placed in a sterile mortar. A small amount of sterile buffered saline was added and the tissue was well ground with a sterile pestle and sand. Sterile buffered saline solution was added to give an approximately 10% tissue suspension. The supernatant from the ground kidney suspension was drawn off with a sterile dry 2 ml. disposable syringe and a 25 gauge needle and three drops inoculated into each of three tubes of Fletcher's semi-solid medium. This technic was devised by the Leptospira Research Laboratory, United States Public Health Service, Communicable Disease Center, Chamblee, Georgia. (It should be noted here that Fletcher's medium, although not designed for bacterial cultures, supports the growth of most of the fastidious organisms. It contains 10% sterile rabbit serum and a small amount of agar.) After intervals varying from 48 hours to five days, subcultures were made to blood agar plates, thioglycolate broth, Sabourauds' slants and fresh Fletcher's media. Cultures and subcultures were examined daily and isolated organisms were identified.

Laboratory Findings

Of a total of 507 cultures, 432 showed no growth. Of the 75 (14.7%) cultures showing growth: pathogens alone were isolated in 36, pathogens and ordinary air contaminants in seven and contaminants alone in 32. The latter consisted of the usual air contaminants and saprophytic fungi. No pathogenic fungi were isolated. The pathogenic bacteria were, for the most part, streptococci. Thirteen strains of streptococcus were isolated from various animals. Other pathogens were coliforms, *Staphylococcus aureus* and *Staphylococcus albus*. No strictly anaerobic organisms were isolated.

The most interesting findings, of course, were the streptococci; eight strains of *Streptococcus viridans* were isolated, five of them in pure culture, three showing alpha hemolysis. Three other strains of *Streptococcus viridans* were isolated in cultures that also contained *Bacillus subtilis* and *Serratia marcescens*. The animals from which the *Streptotoccus viridans* were isolated were female rat, male mouse, male gray fox, male red fox, female rabbit, female mouse, and female red fox.

The most unusual finding was five strains of Beta hemolytic streptococcus in five raccoons; these were all group G. Four of these were in pure culture. In these five raccoons growth first appeared in kidney cultures; urine cultures became positive later.

Histopathological examinations were performed by Dr. Robert Haberman of the National Institutes of Health. Dr. Elaine Updyke of the Communicable Disease Center kindly typed the strains of *Streptococcus hemolyticus*, and the saprophytic fungi were identified by Dr. Lucille Georg of the same institution.

Results

	Pathology
A. Pathogens Isolated	
1. Coliforms	
2 gray fox	1
1 wood rat	0
2. *Streptococcus hemolyticus* Group G	
5 raccoon	2
3. *Streptococcus viridans* alpha hemolytic	
1 gray fox	0
1 red fox	0
1 mouse	0
4. *Streptococcus viridans*	
2 cotton rat	1
1 mouse	0
1 raccoon	0
1 red fox	0
5. *Staphylococcus aureus*	
2 raccoon	0
6. *Staphylococcus albus*	
1 raccoon	1
B. Non-Pathogenic Contaminants Isolated	
1. Bacteria	
1 kit fox	0
1 mouse	0
3 gray fox	1
4 raccoon	0
1 red fox	1
2. Fungi	
1 mouse	0
1 gray fox	0
2 raccoon	0

1	red fox	0
1	rabbit	0
C. Sterile Cultures		
7	red fox	2
19	gray fox	2
9	raccoon	1
1	kit fox	0
4	mouse	0
2	rabbit	0
5	rat	0
3	opossum	0
1	deer	0

Discussion

It is known that streptococcus is a common inhabitant of animal as well as of man.[2,4,5,6,7] Beta hemolytic streptococci, group G, have been isolated from a large variety of animals. In human beings Lancefield and Hare first described group G hemolytic streptococci found in 10 of 142 cultures from the vagina of parturient women. They also found two additional cases of saprophytic strains of group G streptococci from the vagina, six from normal human throats, one from otitis media in a dog, one from fatal pneumonia in a monkey and four from throats of normal monkeys. Sherman and Smith found nine strains of group G or "similar" hemolytic streptococci in human feces. Quinn, Denny, and Riley, studying the hemolytic streptococci in normal school children, found 9.6% belonged to group G.

It is interesting that there appeared to be no pathological changes in the kidneys of the raccoons from which group G. hemolytic streptococci were isolated. No such finding has been described in the literature.[8,3] Fox states, "wild animals do not give evidence of repeated attacks of acute disease and indeed it would seem that they more often die of an acute infection than live to have it repeated." He further states: "it has been claimed that bacteria may be found in the blood stream before evidences of pyelitis present themselves." He cites a case of urethritis in a raccoon and a case of chronic cystitis and edema of the urethra in a second raccoon. No bacterial cultures are mentioned.

It is to be expected that some pathological changes would normally accompany a finding of beta hemolytic streptococci.[1,3] Nephritis is a common finding in animals. Fox has stated that "nephritis has been found in 12.2% of our total autopsies. Mammals show an incidence of 20.6%."

The source of group G Streptococcus infections in humans as well as the reservoir host is not known. These findings may be a clue to this problem. Although most humans are not in contact with raccoons, domestic animals may be in contact, and thus become the intermediate host.

If cultures had been made directly into the more commonly used culture media, it is possible that additional isolations of pathogenic organisms might have been made. Evidence for this possibility is given by the 5 animals that showed histopathological changes in the kidneys in the absence of bacteria in kidney or urine cultures.

Summary

1. Bacterial cultures of urine and ground kidney suspensions of 90 trapped wild animals yielded 19 isolations of pathogenic organisms, two coliform, two *Staphylococcus aureus*, one *Staphylococcus albus*, 14 streptococci.

2. Five strains of Beta hemolytic streptococci were isolated from five raccons; all five strains have been typed in group G.

3. The relationship to human group G Streptococcus infection is discussed.

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Practice Tips On O

THE ONLY ORAL ELECTROLYTE product I have used is Lytron (Mead-Johnson) which is stocked in many drug stores since it is made for human usage. In selected cases, its use effects more dramatic recovery than do antibiotics.

Lytren is an oral electrolyte and sugar preparation. It is not a so-called normal electrolyte combination because it has proportionally high potassium, calcium and CO_2 factors, and low chloride. It is 1% electrolytes and the remainder sugars.

The Lytren routine is time-consuming, which makes it work best under home administration. The dosage I usually use is ½ to 1 oz. daily per 12 or 15 lb. of body weight, mixed with table sugar, dry skimmed milk and water eight to 12 times (or more) per day. Usually, I use Lytren only two to four days.

The force-feeding routine is seldom needed when the dog is on full feed. The water requirements per pound of body weight of the dog are never constant. However, when this oral routine is used, with or without Lytren, the canine usually drinks the water needed. *This is a most important factor in resuscitative procedures of the dog.* The use of Lytren early in oral rehabilitation makes the routine most efficient. No contraindications have been observed.

Medical Usage of Oral Electrolytes

1. Oral electrolytes are needed by the animal that is off feed and has severe diarrhea. In the severe problem, parenteral fluid electrolyte is also recommended at the

On Oral Electrolyte Therapy

C. E. BILD, D.V.M.

Miami, Florida

beginning of the therapy. Usually, two to four days of Lytren usage is adequate. (If Lytren is used in children any longer than necessary, electrolyte retention and edema occur. I have not observed this in the dog.) Oral electrolytes are seldom needed in the puppy that has diarrhea, provided: (1) subcutaneous fluid electrolyte with added calcium gluconate is given, (2) distemper serum and antibiotics are used, (3) the hookworm and ascarid problem is cared for, and (4) good ground beef only is fed four times daily for a day or two.

2. There is a medical need for Lytren or oral electrolytes whenever the urine chloride is low in comparison to the specific gravity of the urine. This is the situation usually in our usage of oral electrolytes. It is an instance where the information gained and the remedy applied are peculiarly from the canine and do not relate at all to the application of the same tests in humans. This is to say, that because the canine does not perspire, and can handle electrolytes under the stress of anesthesia, sedation and some illness, there is correlation having clinical application between the specific gravity of the urine and urine chloride. The occasional chronic nephritis animal has a use for small amounts of oral electrolytes.

Combined Medical-Surgical Usage of Oral Electrolytes

Oral electrolytes often have a place in post-surgical convalescence of cases such as the debilitated (pyometritis) or severely injured animal. Oral electrolytes are needed only for three or four days in most surgical cases. A good rule is to use the sugar, dry skimmed milk and vitamin supplement routine eight to 12 times daily until the animal eats well three or four times daily for four days. As with purely medical cases, the question of whether or not oral electrolytes should be used can be determined by correlating the urine chloride with the specific gravity of the urine. Actually in any problem, if the dog is on good feed, chances are it does not need oral electrolytes. But it should be remembered that this is one of those rules that work *nearly* every time.

Most fractured femurs that are pinned do not require care with oral parenteral electrolytes or blood infusion. However occasionally an animal suffers severe trauma. Again, in the over-all perspective, the case progress is noted by loss of body weight, loss of hemoglobin level or both. In the early stages of stress situations there may be dehydration and an elevated hematocrit or hemoglobin.

Summary of Oral Electrolyte Usages on Small Animals

In the ambulatory stage of most surgical and medical problems, the need for electrolytes and fluids is common. When an oral electrolyte such as Lytren is given with dry skimmed milk, table sugar and a vitamin supplement eight to 12 times daily, the dog usually drinks the water it needs. The water need in a specific case is more accurately calculated by the animal when these precepts are followed, than is the water need calculated by the clinician.

GASTROINTESTINAL CONDITIONS OF SMALL ANIMALS

BENNETT J. PORTER, D.V.M.

Saint Louis Park, Minnesota

Presented at the Region 3 Meeting of the American Animal Hospital Assn., Burlington, Iowa, November 12-13, 1958.

MUCH of the material presented in this report comes from my own files, and therefore it represents my own experiences. Needless to say, such information could easily be misleading and inaccurate in that diagnosis and treatment might have been wrong. With the exception of foreign bodies and some other secondary conditions, many cases lack accurate diagnosis. Only when the patient died and postmortem examinations were performed was our diagnosis confirmed or discarded. Even necropsy failed to reveal helpful information at times.

We may differ in our approach to gastrointestinal problems, but one thing is certain: clients are uniform in that they always give the same information — usually misleading. This is not a matter of malice. It is only that clients do not interpret symptoms as we do. Also, clients are usually not aware that their pet is sick until the problem is serious.

When we think of conditions involving the digestive tract, and conditions that produce gastrointestinal symptoms, we must not think only of the digestive system extending from the oral cavity to the anal outlet, but also organs in the thoracic and abdominal cavities.

This immediately focuses attention on two categories, primary and secondary. When we speak of *primary*, we think of all the conditions producing lesions in the digestive canal or the serosa or other integument of the alimentary tract. Some of these in the order of their importance are: inflammation, foreign bodies, intussusceptions or incarcerations, dilatations and constrictions, patent orifices and malignancies.

Most of these conditions will produce parallel symtoms. One may be predominant in one patient and absent in another. These are pain, loss of appetite, vomiting, diarrhea, dehydration and a mental attitude, usually in proportion to the severity of the disease.

I realize that for years we have been treating these cases fairly successfully without accurate diagnosis; nevertheless, accurate diagnosis and specific treatment are gratifying to the doctor and assuring to the client.

Three conditions that have been presented at our hospital involving the esophagus are foreign bodies, dilatations, and constrictions. In checking as many records as possible on foreign bodies, I found that 100% refused to eat, according to the owner's report, as well as clinical verification. Most patients had an anxious look and few would even take water. Some patients of long standing were weak when presented, but were in excellent physical condition. No attempts were made by the patients to dis-

lodge the foreign body by vomiting. I recall one patient that made repeated attempts to eructate like the bovine by closing the glottis.

Most cats with needles acted dumb and listless, and refused all food and water. However, in cases where part of the needle was protuding into the pharynx, enough irritation was produced to cause continual gagging.

Diagnosis, as a rule, is not difficult. Careful weighing of the history and the symptoms, coupled with *x*-ray, with or without barium, will usually tell what and where the trouble is.

Treatment varies. Some practitioners use emetics and claim good results. I have found them to be useful only when foreign bodies were of a soft nature. We believe that the return trip up the esophagus may be hazardous if the object is rough or has sharp points. I have been able to relieve most of these conditions with the aid of a small rubber stomach tube to cautiously move the object back into the stomach. Assuming that some damage will be done, the distance is shorter in most cases than it would be if you were going to remove it through the mouth. Furthermore, if by chance the object were to become lodged, it would be easier to operate in the vicinity of the hiatus than in the region of the heart or the large blood vessels.

Dilatations and constrictions, which are the exact opposite, present some similarities. These patients will usually eat and drink. However, in cases involving dilatation, liquids are retained, but solids are retained for only a short period and then vomited. This is not true in cases of constriction: foods and liquids are vomited almost immediately. Here again, the history and the aid of the *x*-ray will facilitate diagnosis.

I have nothing encouraging to offer in the line of treatment. Schnelle reports a cure with massive doses of vitamins. Banthine helped in one case treated at our clinic. Constrictions in the vicinity of the cardia may be helped by the so-called Beck operation. I am aware that tumors may occur in the esophagus, but I have never seen one.

Foreign bodies in the stomach present a bizarre group of symptoms, depending upon size, shape, weight and whether they are smooth or sharp. A foreign body that does not irritate the gastric mucosa probably produces few symptoms. Many of these patients eat and act normal. Others vomit, refuse food and appear to be extremely sick. A good history is most important in effecting diagnosis and treatment of these patients. *X*-ray pictures are of great value, unless the foreign object is plastic. It is difficult to palpate foreign bodies in the stomach unless the patient is extremely thin, and even then it is doubtful. Treatment varies, depending upon the object involved. Emetics, gastric lavage, the use of the gastroscope, laporotomy, gastrotomy and sometimes a combination of the two are indicated. If apomorphine is used, it must be used with caution.

Intestinal Obstructions

Before getting into the problem of intestinal obstructions, I would like to note some of the knowledge revealed to us by the medical researcher. Granting that the type of obstructions in the human being differs considerably from those encountered by the veterinary practitioner, there are still many basic similarities. Obstructions of the bowel can be classified as simple and complicated. Simple obstructions interfere only with the continuity of the bowel, whereas complicated obstructions interfere not only with the continuity, but with circulation as well.

The location of the obstruction is important from the standpoint of emergency treatment. High obstructions which are attended by acute distress, vomiting, pain, and distension are the most severe. Obstructions in the lower bowel are more benign, but if left untreated they will become as severe as the higher type. The content of an obstructed bowel is fluid and gas. Both are present in varying amounts. The extent to which each of these components contributes to distension in any given instance is difficult to predict. On the whole, however, the longer the duration of an obstruction, the greater the fluid content.

Acute obstructions are largely gaseous in character. In high obstructions, vomiting of intestinal fluids is both more frequent

and copious. The loss of fluids from obstruction of the colon is negligible.

Dehydration in early obstruction of the colon is unlikely. In high obstruction there is a terrific loss of sodium, potassium and chlorides through vomiting. It has been proved repeatedly that simple high obstruction that is clear of the duodenum and not relieved will cause death in a few days. However, if simple saline is administered, the life of the patient can be extended several weeks.

What actually takes place in a patient that vomits continually as a result of high obstruction is that the blood plasma is first drawn upon, with ensuing concentration of plasma. The blood, in turn, is replenished from the mobile interstitial or intercellular fluid compartment. Loss of this fluid gives rise to clinical evidence of dehydration. If the obstruction is near the pylorus, loss of the chloride ion will be greater than the sodium cation, in consequence of which an alkalosis develops, with an increase in plasma bicarbonates accompanying the loss of sodium and chloride ions in the vomitus. A lowering of plasma chlorides occurs, and incident to dehydration oliguria ensues with consequent retention of nonprotein nitrogen in the blood.

When large quantities of saline are used to replace the loss of fluids and electrolytes, the deficit of sodium is made up before the more extensive loss of chlorides is replenished, and the excess of sodium is excreted in the urine to re-establish the normal balance.

It is interesting to note that there is a direct connection between the loss of sodium, potassium and the chlorides and the paralytic syndrome called ileus. In any case, a decrease of the ions in the extra-cellular fluids results in atony of the gut, which becomes responsive to smooth muscle stimulants only when the plasma ionic concentration of the elements is restored to normal.

Intestinal Obstructions

Much of the foregoing was acquired from the text, *Intestinal Obstructions*, by Wangensten. Any doctor engaged in small or large animal medicine would be wise to add this book to his library.

As stated previously, the symptoms and the severity of intestinal obstructions vary according to location and to whether obstruction is complete. The state of health of these patients will also vary, depending upon the length of time that obstructions occurred. Most patients will not eat. All will have pain in varying degrees; varying amount of vomiting is evident, depending upon location of the obstruction; facial expression as a rule is "anxious." Palpation may reveal an object. Palpation should be carried out meticulously. Careful examination of all parts of the abdominal cavity should be made. If this obstruction is caused by an intussusception, a cigar-like object spongy to the touch may be felt. The *x*-ray is very useful in developing a diagnosis, although it may not always reveal the nature of the obstruction, but may show tremendous amounts of gas suggestive of an obstruction.

I feel safe in saying that surgery is almost always indicated. I am certain that most obstructions with which we have to deal are simple obstructions caused by foreign bodies, and circulation is not interfered with to any great extent. Changes in the blood following dehydration are similar, and of course indicated treatment is surgical.

When considering the inflammatory troubles that produce gastrointestinal conditions, etiological factors must be considered. There are many, such as diet, bacteria, viruses, protozoa, parasites, etc. The dog, being a scavenger, would turn down good food for a chance to raid a garbage can. However, I have never felt that ptomaines as they are related to the human being, were of too much importance in the dog. I could be wrong. Nor do I think that botulism is too important as an individual syndrome. Again, I could be wrong.

I would like to shy away from bacteria as a specific cause of any type of intestinal trouble. I have never been able to learn the part bacteria play in any specific case in which postmortem examination has been made with cultures and tissue sections evaluated by a pathologist. I usually receive a letter, telling me of all the pathological findings, but I have yet to get even a conjecture as to causative agent. I reluctantly have to face my client with a bar-

rage of cloudy swelling, cellular infiltrations, hyperemias, infarcts, etc., which I am sorry to say, means little to me and much less to my client.

It hardly seems necessary to mention acute gastritis, because I am sure that all practitioners are acquainted with the condition. We find this condition more common following holidays, probably as a result of overeating. These patients vomit continually so long as there is food or water to be consumed. They eat, drink and vomit again. I believe that this is only mild inflammation of the stomach, involving superficial layers of the mucosa. In most cases all that is required is to withhold all food and water for 12 to 24 hours. Vomiting usually stops shortly after food and water are withheld. This gives the stomach a chance to rest and return to normal, which is quite rapid. I have often wondered what becomes of a stray with this condition. I can imagine that this could be serious if allowed to go on untreated. Some doctors administer bismuth preparations orally. I believe that nothing should be given by mouth in these cases. I suppose that untreated, this condition could lead to collapse. All cases that I have ever seen have responded to treatment quite rapidly.

We occasionally see putrefaction dysentery, where putrefied material lies on the floor of the intestinal tract, acting as a foreign material. Large amounts of body fluids pour into the intestine and produce a watery and odorous diarrhea. The state of dehydration can be far advanced in these cases if neglected.

It is possible to be presented with a patient that is near collapse. If these patients are given fluids in sufficient amounts to replace the loss, and a good physic or enema, followed with one of the bismuth preparations containing some of the sulfas, recovery is usually quite rapid. Antibiotics, sulfas or bismuth preparations do little good unless the decomposed material is first eliminated.

We have seen a condition in our hospital that has baffled us for several years. To date, I am not in a position to give it a name. These patients, usually four to ten years of age, are presented with a history of occasional vomiting, refusal of all food and water, and are extremely sensitive over the abdomen. They have a toxic look.

When we first saw these cases we tried administering bismuth preparations, which were vomited immediately. *X*-ray studies showed that the material never moved out of the stomach. A laporotomy was performed on the first case. We found a gut flat and ribbon-like, absolutely void of contents in the lumen, slightly inflamed and completely paralyzed. The stomach itself was not too much affected. Our deductions were that in view of the fact we could not reach the intestines via the stomach, we would inject bismuth containing sulfa directly into the lumen. Four ounces soon delineated through the bowel and peristalsis was re-established rapidly. Even the color of the bowel was improved before the belly was closed. I wish that I were able to tell you more about this condition. I can only add one more fact: we have seen about ten of these patients, and all have recovered with no further treatment. As a matter of fact, by the time they are out of the anesthetic they are well on the road to recovery.

Enteritis

There are many ways to classify enteritis. I like to classify it as simple or catarrhal and deep or destructive. The catarrhal type involves only the superficial layers of the intestinal mucosa, and in my belief is probably dietary in nature. The diarrhea is not fulminating. The patient may be slightly distressed and usually refuses food or eats reluctantly. Occasionally, the diarrhea will be streaked with blood and in advance cases of- hookworm infestation, the characteristic rust-colored bloody diarrhea is evident. We base our diagnosis on the lack of severe illness plus the other symptoms, along with the history that the dog does not have good eating habits, such as garbage feeding or overeating. Treatment is usually effective and consists of enemas, sulfas, antibiotics and bismuth preparations. If hookworms are present, these must be eliminated. Deep or destructive enteritis presents a different picture — one of severity. In these cases, I believe that pathogenic bacteria and proto-

zoa may play a big part in the pathogenesis Many of these cases are probably catarrhal types that have been neglected. Many of these patients are passing blood in large amounts when presented. They are extremely sick and some of them near collapse, either from blood loss or of extreme toxicity. Many die before treatment can be started. I feel that we are dealing with a nonspecific condition. Treatment is symptomatic: blood, if anemic; fluids, if dehydration is present; plus sulfas and bismuth.

The secondary conditions that produce gastrointestinal troubles and symptoms require a long report. To mention a few that would warrant future analysis: distemper, hepatitis, leptospirosis, kidney conditions, peritonitis, and ileus.

In conclusion, I would like to say:

1. The vomiting dog presents a real challenge to the doctor.
2. If you must, give only a tentative diagnosis to begin with, because the picture may look entirely different in 24 hours.
3. Always do a complete urine check if you want to avoid embarrassment.
4. These conditions are prevalent enough and important enough to deserve the best in treatment.

Disinfectants

Disinfectants for animate and inanimate things is a subject frequently discussed among veterinarians especially in view of what frequently appear to be exaggerated claims made for some commercial products. We must bear in mind that several factors are to be considered: (1) the nature of the material to be disinfected, such as porous material (wood for example, which requires deep penetration), or porcelainized things; (2) instruments must not be harmed; (3) living animal tissues must not be excessively devitalized or killed; (4) are we trying to destroy ordinary pustulants such as staphylococcia tuberculosis organisms, viruses, spores, protozoa, parasite eggs or what have you.

For disinfection of premises, scalding in the form of flame or steam is excellent, but use is limited to inanimate objects — they and some chemical disinfectants coagulate protein. For general premises, buildings and grounds where the odor is not objectionable, liquor cresolis saponatus (compound solution of cresol) has a high rating. In addition, it is destructive to most viruses. It makes a clear solution — 3% in soft water.

Five pounds of hydrated or water slaked lime — not air slaked — with one pound of lye or caustic soda dissolved in ten gallons of hot water is a favorite for disinfection of premises contaminated by foot-and-mouth disease.

Formaldehyde, a gas — in the official 40% solution it is "formalin" — is excellent when the temperature is 65 F. or higher with high moisture content, when the gas is released in the usual permanganate of potash-formalin reaction. For this purpose it is virtually standard for the disinfection of poultry incubators and incubator rooms for the control of pullorum disease. For skin cleansing preliminary to surgical intervention, soap and water, followed by grain alcohol alone, or the application of tincture of iodine stand by themselves. Bichloride of mercury in solution or otherwise is a poor germicide. Phenols — carbolic acid, etc. — are fair, but a 7% solution is maximum. If they float on the top of the water they burn.

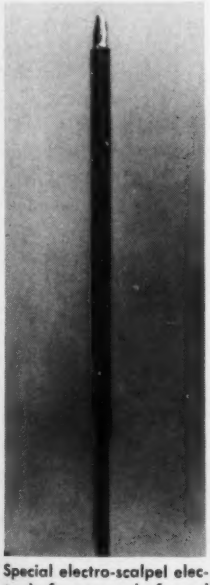
Many other agents, not mentioned in this brief article, have restricted value. Spores are so highly resistant to destruction that, with the exception of the flame, many hours of exposure to chemicals are usually required. Hypodermic needles and syringes once contaminated by highly resistant virus are best subjected to heat sterilization. Hinged instruments must always have all particles of soft tissues removed by scrubbing with soap and water, and them immersion in isopropyl alcohol, 70 to 90%, or in a formalin alcohol combination or boiling, though the latter harmfully affects a fine cutting edge.

Here each month are published ideas, suggestions and comments picked up by VM reporters at veterinary meetings.

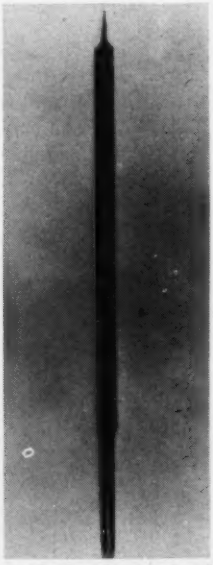
Small Animal Clinic

Debarking — Ventriculocordotomy

DOGS CAUSING A DISTURBANCE by loud barking may require removal of the vocal cords to prevent creating a nuisance. A method of complete removal of the vocal cords has been developed with the use of the Electro-Scalpel (Miller Surgical Company).



Special electro-scalpel electrode for removal of vocal cords. Made from 3/32 in. by 4 in. fixation pin with the end flattened for 3/16 in.



A plastic tube is placed over the pin extending from the exposed tip to within an inch of its opposite end.

General profound anesthesia with barbiturates is required. The mouth is held open with a speculum and the tongue pulled forward with tongue forceps. The epiglottis can be grasped with Allis tissue forceps, or the vocal cords can be brought into view by an attendant holding and manipulating the larynx from the outside. Good light is essential to see into the larynx. The V-shaped vocal cords appear as thick folds extending from the vocal processes of the arytenoid cartilage downward and medial to the thyroid laminae. Any mucous in the pharynx and larynx is removed with a cotton tip applicator. The removal of the vocal cords is accomplished with the use of the metal tip of the tonsil snare, or by a special electrode made by using a 3/32 in. by 4 in. fixation pin with the end flattened for 3/16 in.

A plastic tube is placed over the pin for insulation extending from the exposed tip to within one inch of the opposite end. Each vocal cord is seared off with the electro-scalpel and the tissue is removed from the larynx with forceps. If any hemorrhage occurs, it should be checked before returning the dog to its cage to prevent danger of suffocation.—*A. D. Knowles, D.V.M.*

Feeding the Turtle

THEY SHOULD BE FED three times a week, the cage kept clean, and the water fresh. Heat should be constant at 75 to 80 F.; and when changing water, the temperature of the fresh should be the same as the water being replaced. Aquatic turtles, fed in water, will eat chopped fish and meat or whole small fish, and some lettuce. Land turtles, fed on land, will eat chopped lettuce, carrots, apple, banana, celery, and meat, mixed. —*L. E. Fisher, D.V.M.*

A.A.H.A.

Annual Meeting

CONTINUED GROWTH of the American Animal Hospital Association is reflected in the election of Dr. Frank R. Booth as the first full time executive secretary. Executive offices will shift to Elkhart, Indiana on January 1. Dr. Wm. K. Riddell shoulders the job of president for the coming year with Dr. Wayne H. Riser, president-elect, Dr. Lester R. Barto, vice president and Dr. Ralph Ruggles, treasurer.

Annual awards went to John Gottlob, senior student from Texas A & M, for the Moss essay contest; Dr. Gerry B. Schnelle, Mark L. Morris Foundation Award; and Dr. James Archibald, the Gaines Foundation Award. A special A.A.H.A. Certificate was presented to Dr. Mark L. Morris in recognition of exceptional service to the profession.

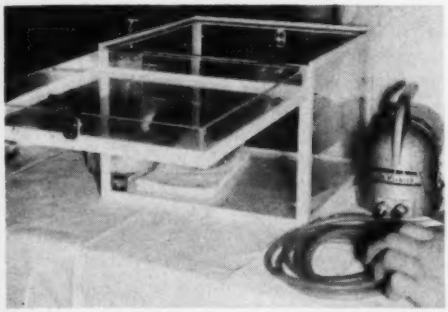
Pre-convention workshops provided stimulating and idea provoking study in orthopedic surgery, neurologic diseases, clinical technics and hospital management for the more than 350 in attendance.

Throughout the three-day meeting, an open exchange of divergent ideas reflected the changes that are taking place in the practice of small animal medicine.

Selected papers presented at the meeting will appear in VETERINARY MEDICINE.

Ether Anesthesia in the Cat

An excellent method of feline anesthesia was demonstrated in the preconvention workshop with the use of a plastic box. Construction is of ¼ in. plexiglass, 12 in. by 12 in. by 10 in. (Nicholson Manufacturing). With the cat in this box, vaporized ether is supplied through a porthole in the side with a no. 841 Devilbis Nebulizer. Rate of flow may be controlled for desired rate of anesthesia. A no. 501 Devilbis Compressor supplies vaporizing pressure to the unit through rubber tubing.



Anesthesia is gradual with virtually no induction or recovery excitement. When the patient reaches a desirable plane of anesthesia, it is removed from the box and the desired level of anesthesia maintained with the ether cone. No pre-medication is necessary for safety but atropine may be used if desired to control salivation.

Safe Muscle Relaxation

Dr. Robert M. Stader demonstrated the merits of succinylcholine chloride in dogs. Previously used in horses, recent observations show that rapid inactivation of this potent muscle relaxant affords a highly desirable safety factor in dogs. Marketed as Sucostrin (Squibb) a new small animal solution containing 110 micrograms/cc. will soon be available. A dosage of 18 to 20 micrograms per kilogram of body weight seems to work well in dogs. This is approximately 1 cc./5 lb. of body weight using the new small animal concentration. The large animal solution may be used by appropriate reduction of dosage or dilution. Each cc. of the large animal product contains 20 mg. of drug or the equivalent of 200 cc. of the small animal product.

Overdosage results in respiratory arrest but if mechanical respiration is provided, normal respiration will return in about 30 minutes following administration of deliberately excessive doses.

Preventive Canine Medicine

A complete program of management and client relationship was introduced in the hospital management section of pre-convention seminars by Dr. Theodore Lafeber. Printed instruction sheets are provided clients with complete directions for care and veterinary services from the prenatal period through whelping and growth of the puppies. Routine immunization, laboratory checks and dental care are integral parts of this unique new approach to small animal practice. A complete discussion of this program and details on Doctor Lafeber's appointment and minimal hospitalization practice will be presented in a future issue.

Objectives of Fracture Repair

Dr. Jacques Jenny's description of the biochemistry of bone repair layed basic background for the many orthopedic discussions throughout the session. Remembering that the objective of fracture repair is restoration of function, rather than perfect mechanical union, Doctor Jenny described the processes involved as a special form of wound healing.

During the first 48 hours following fracture, the pH of the site must remain on the acid side. This is essential to clear debris and supply calcium in solution which can come only from the calcium reserves of normal bone. Later it is essential that the pH of the fracture shift back to the alkaline side so that the enzyme phosphatase can carry out its role of wound repair.

Most trouble is encountered in the first week if perfect immobilization is not accomplished. Excessive movement can prolong the period of acid pH and delay the processes of bone repair. Protein nutrition during bone repair is more important than Ca/P intake.

MICRO Dirofilaria immitis in the Dog

This preliminary report suggests a new approach to heartworm control.

J. H. YARBOROUGH, D.V.M., LAYSON T. DOTY, D.V.M., F. EARL BECKER, D.V.M., JACK HAGGARD, D.V.M., and D. O. BEUSSE, D.V.M.

Miami, Florida

IN THE EVALUATION of Dizan premix (Corn States Laboratories) for treating hookworms, roundworms, whipworms and strongyloides in the dog, a reduction and then elimination of microfilaria in the blood stream of heartworm infected dogs was noted.

Ten dogs, infected with *Dirofilaria immitis*, were treated with Caparsolate Sodium (Abbott), using 0.2 cc. per pound for three days. Stage of infection in these ten dogs ranged from one to four-plus with the concentrated heartworm test. Fifteen days after treatment was completed, Dizan premix was placed in their food, using 10 mg. per pound, or a tablespoonful of Dizan premix for each 20 lb. body weight. This was continued for 15 days. Testing for microfilaria with the concentrated heartworm test was carried out. All dogs were free of microfilaria and on repeated tests no microfilaria have been found in any of the ten dogs. Two of the dogs were last treated six months ago, and are still negative.

It is not known if Dizan will kill adult *Dirofilaria immitis*. Present plans call for ten heartworm infected dogs to be treated over a period of time. Dogs will be sacrificed in order to determine whether adult worms are dead, and how long it would take for Dizan to act.

Two dogs are under observation in a kennel where all other dogs are heavily infected with heartworm. After six months, with two courses of Dizan for 15 days, these two dogs still test negative. Of course this is not conclusive and plans call for use of the product on a large number of dogs, with one-half as untreated controls.

In using Dizan on a large number of dogs for intestinal parasites, no toxicity has been observed. Occasional loose stools were noted, however, when the remedy was first administered. Since other drugs used to eliminate microfilaria are toxic, it would appear, from this limited experiment, that Dizan may be the drug of choice for elimination of micro-*Dirofilaria immitis* after treatment with Caparsolate.

Practitioners' observations on new drugs are reported here each month as clinical notes, and do not constitute controlled research.

Clinical Report

TREATMENT for ACUTE CANINE PNEUMONIA

N. A. ROTHENBERG, D.V.M.

North Hollywood, California

THIS REPORT concerns use of a combination antibiotic-corticosteroid capsule in treating acute canine pneumonias. The combination was Delta-Albaplex (Upjohn), containing in each capsule tetracycline phosphate complex equivalent to tetracycline hydrochloride, 60 mg., novobiocin sodium, 60 mg., and prednisolone, 1.5 mg.

Successful treatment of respiratory infections with tetracycline, novobiocin, or combinations of the two, has received repeated confirmation in both veterinary[2,8-10] and human literature.[11-14]

Therapeutic advantages derived from use of Delta-Albaplex are: (1) wider range of antibacterial activity than therapy with single antibiotics, (2) antistress effect, (3) anti-toxemic effect, (4) anti-inflammatory effect, (5) euphorogenic effect, and (6) orexigenic effect. Euphorogenic and orexigenic effects were particularly noticeable in the current series and contributed immeasurably to total welfare and recovery rate.

Symptomatology

In southern California, acute pneumonias in dogs are common especially in the late summer, when daily temperature fluctuations are maximum. Days are extremely warm at this season, whereas nights are very cool. The variance may be as great as 75 F. within a few hours. Signs are particularly severe and include temperatures of 104 to 106 F., generalized rales, pleurisy, gasping, ischemic membranes, and collapse. A few also demonstrate convulsions, possibly due to upset of the heat-regulating mechanisms of the hypothalamus, termed by some the "hypothalamic syndrome." This syndrome has been noted particularly in Basset Hounds with acute pneumonia, a number of them dying in convulsions.

Case Reports

In one kennel of Irish and English Setters, six developed with acute pneumonia. One Irish Setter and one English Setter, both one year, demonstrated purulent oculonasal discharge, temperatures of 105 to 106 F. and typical acute pneumonic signs. Penicillin-streptomycin injections, oral triple sulfonamides, and guaiacol steaming were applied for seven days with only sluggish response. Anorexia and extreme weakness became apparent, the Irish Setter staggering and the English Setter unable to rise. Temperatures were 103 F.,[a] there was less gasping, but fatal termination seemed probable. Both dogs were then transferred to the antibiotic-steroid combinations, three capsules b.i.d., and within 24 hours their temperatures dropped, and they responded dramatically. Appetite-stimulation was par-

ticularly prominent. Treatment was continued for an additional five days at which time no further therapy was necessary.

Meanwhile, three additional setters in the same kennel were affected, all older dogs between three and four years of age. One female could not rise. Delta-Albaplex was administered, four capsules b.i.d., and within 12 hours the dog was up and eating. The other two were not quite as sick but were also treated for a total of three days. Recovery was rapid and complete in all three cases.

The sixth dog demonstrated pneumonic symptoms and convulsions. Exhaustion, vomiting, diarrhea, temperature 103.2 F., and evidence of intercurrent distemper were present. Immune distemper-hepatitis serum was given, 25 cc. intravenously, and four capsules of Delta-Albaplex, twice daily. In 36 hours convulsions ceased and by the seventh day therapy could be stopped.

In another kennel, 30 Bassets, 2 to 18 months of age, began to break with acute pneumonias. Sulfonamides in vastly inadequate doses, penicillin-streptomycin injections, and other insufficient remedies had been applied by the owner to no avail. Now, ten days later, many were sick and weak, ten having frank acute pneumonia. The ten were randomly divided into two equal groups, five receiving Delta-Albaplex, two capsules, b.i.d., five receiving triple sulfonamides 1 gr./lb. body weight daily, and penicillin-streptomycin injections. Of the five on Delta-Albaplex, four recovered in five to six days. The fifth dog, initially moribund, failed to recover. Of the five receiving other treatment, two responded in 11 days but required an additional three weeks for recovery. The other three dogs died.

No antibiotic side actions, such as alteration in character of evacuations were noted. Nor were signs of corticosteroid overdosage, such as increased thirst, water retention, or polyuria, apparent. However, as with other corticosteroids, it is important that adrenocortical support not be withdrawn prematurely. In the reported cases, Delta-Albaplex was administered for an additional two or three days after the temperature returned to normal and all signs of infection disappeared. Patients were then placed on doses of methylprednisolone equivalent to the dose of prednisolone contained in the antibiotic-corticosteroid combination. These methylprednisolone doses were in the order of one-half the dose of prednisolone contained in Delta-Albaplex, and were reduced slowly over the course of several days.

Summary

Sixteen dogs with acute pneumonia were treated with Delta-Albaplex, an antibiotic-corticosteroid combination in capsule form. The antibiotics, tetracycline phosphate complex and novobiocin, adequately controlled the offending microorganisms, while the prednisolone markedly reduced morbidity and mortality through its known antistress, anti-toxemic, anti-inflammatory, euphorogenic, and orexigenic effects.

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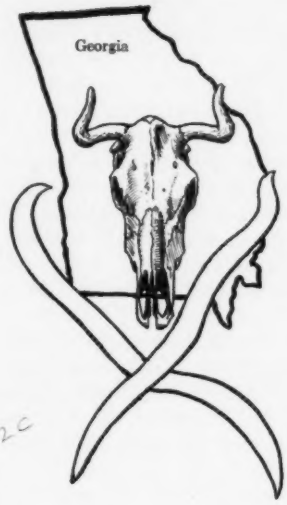

Continuing studies of the incidence and intensity of various species of parasites in cattle in the Coastal Plain Region of Georgia confirm the great economic significance of clinical parasitism to the livestock industry.

Worm Parasites in Cattle from South Georgia

WILLARD W. BECKLUND, B.S., M.A.

Animal Disease and Parasite Research Division
Agricultural Research Service, USDA
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Tifton, Georgia

OBSERVATIONS MADE BY ANIMAL-DISEASE WORKERS in Georgia during the last ten years indicate that the number of cattle suffering from clinical helminthic parasitism has been steadily increasing, and that resulting losses have been of considerable economic importance to farmers. Working at the Diagnostic Laboratory of the Department of Animal Diseases, Georgia Coastal Plain Experiment Station, Tifton, Georgia, Andrews, Sippel, and Jones[1] reported in 1953 that the percentage of cattle subjected to postmortem examination and found to have suffered with clinical parasitism was negligible prior to 1950; however, during the next three years it increased progressively to 6, 11, and 17%. More recent necropsy observations at Tifton reveal that during a 12 month period, 1956-1957, approximately 25% of the cattle were suffering from clinical parasitism.[2] An increase in losses from helminth parasites apparently also has occurred elsewhere in the southeast; in 1955, Bailey[3] reported that clinical parasitism was the diagnosis for 11.1% of 422 cattle on which autopsy had been performed at the Diagnostic Laboratory at Auburn, Ala., during an approximate 22 month period, 1953-1955.

Because this yearly increase in bovine parasitism represents a proportionate increase in economic losses, a study was initiated in 1955 to determine incidence and intensity of various species of parasites in cattle in the Coastal Plain Region of Georgia. The results thus far obtained in this survey are described in this report.

Acknowledgment

The writer gratefully acknowledges the assistance of Dr. M. B. Johnson, of the Meat Inspection Division, A.R.S., and personnel of Armour and Company, Tifton,

Georgia, who made arrangements for the collection of some of the postmortem material and furnished the writer information as to the origin of some of the cattle examined. Messrs. Ralph Fendley and Donald Ellis, of this laboratory, also assisted in this study.

Materials and Methods

All organs examined for parasites were procured from abattoirs after removal from calves or yearlings, 6 to 18 months of age. The esophagus, rumen, abomasum, small and large intestines, and lungs of each animal were removed soon after death and taken to the laboratory for examination. The general method for recovery and estimating total numbers of gastrointestinal worms was similar to the procedure used by Porter.[4]

Fecal samples were collected from some cattle and examined for nematode eggs by the method described by Seghetti,[5] with only a slight change as to dilution.

The 29 cattle examined originated on farms widely distributed throughout the Coastal Plain Region in Georgia, where the animals were maintained on pastures until a short time before slaughter.

Results

All cattle examined harbored nematode parasites; the total number of nematodes recovered ranged from a minimum of 85 to a maximum of 22,509. The average number per animal was 4,331. The number of species found in any one animal ranged from three to eight. The nematodes represented 11 genera and 18 species. These parasites, arranged in descending order of their incidence, together with data revealing number and percentage of cattle infected, minimum, and estimated maximum numbers recovered, and average number of each species recovered per infected animal are recorded in table 1.

The large twisted stomach worms are listed in table 1 as Haemonchus spp. because identification of specimens from four animals was not completed. Measurements of the spicules of the male specimens of Haemonchus from the remaining 20 cattle infected with large stomach worms indicated that 19 animals harbored *H. placei* of Roberts *et al.*[6] and one harbored *H. contortus* of these authors.

Because all five whipworms collected were females, they were not specifically identified and are therefore designated as Trichuris sp. in table 1.

Table 1 reveals that 20, or 69%, of animals examined were infected with *Oesophagostomum radiatum*. This figure includes five animals in which specimens were not found in the lumen of the intestines; but larvae or nodules associated with the larvae of this parasite were found in intestinal walls.

TABLE 1. Data on Nematodes Found in 29 Cattle Slaughtered in Georgia Abattoirs

	Cattle Infected		No. Worms	
	No.	%	Range	Avg.
Haemonchus spp.*	24	82	1— 556	156
Cooperia punctata	24	82	3— 2,560	1,393
Trichostrongylus axei	21	72	1—14,700	2,591
Ostertagia ostertagi	21	72	6— 880	315
Oesophagostomum radiatum	20**	69	1— 111	26
Cooperia pectinata	15	52	7— 2,560	928
Haemonchus similis	12	41	2— 80	25
Setaria cervi	10	34	1— 26	6
Bunostomum phlebotomum	8	28	1— 29	8
Capillaria bovis	5	17	1— 40	14
Trichuris sp.	5	17	1— 1	1
Ostertagia lyrata	5	17	1— 40	17
Gongylonema pulchrum	3	10	1— 7	4
Trichostrongylus colubriformis	2	7	1— 2	1
Trichostrongylus longispicularis	2	7	3— 120	61
Cooperia spatulata (males only)	2	7	80— 400	240
Strongyloides papillosus	1	3	200— 200	200

H. placei and *H. contortus* of Roberts *et al.*[6]
**Nodules only, in five.

Fecal samples were collected from 22 of 29 cattle examined, and the number of ova per gram of feces was compared with the number of gastrointestinal nematodes recovered in the individual animals. Although no eggs were observed in five samples, cattle from which they were taken yielded from 104 to 4,960 nematodes at postmortem examination. Thirteen samples had relatively low counts, ranging from four to 280 ova per gram; however, 85 to 22,509 nematodes were recovered from the gastrointestinal tracts of these same cattle at necropsy. The remaining four samples had higher counts, which ranged from 496 to 1,504 ova per gram, and 1,040 to 11,767 roundworms were recovered from these animals at the postmortem examination.

Discussion

Fifteen of 18 species of nematodes collected in this survey have been previously reported from cattle in Georgia by other workers, namely, Swanson,[7] Cooperrider,[8] Porter,[4] Andrews *et al.*,[1] Bailey and Herlich,[9] and Vegors, Sell, Baird, and Stewart.[10] The significance of the writer's findings[11] in regard to *Ostertagia lyrata, Trichostrongylus longispicularis,* and to *Cooperia spatulata* (Becklund, in press) are discussed elsewhere.

The vast majority of the parasites encountered by Porter[4] in a survey of gastrointestinal helminths of cattle in the southeastern states were also encountered in Georgia by the writer. The incidence of infection with Haemonchus, *Cooperia punctata, Ostertagia ostertagi, Oesophagostomum radiatum,* and *Trichostrongylus colubriformis* was about the same as in Porter's[4] survey; the frequency of occurrence of *Bunostomum phlebotomum,* Trichuris sp., and *Strongyloides papillosus* was considerably lower, and the incidence of *Trichostrongylus axei, Cooperia pectinata, Haemonchus similis,* and *Capillaria bovis* was considerably higher in the writer's survey than in Porter's.[4] The writer did not recover Moniezia spp., *Cooperia oncophora,* or *Nematodirus helvetianus,* although Porter[4] found the two last mentioned species in northern Georgia; Vegors *et al.*[10] also recovered *C. oncophora* from yearlings from pastures in the north central part of the state.

The six species found most frequently in the cattle examined were *H. placei* of Roberts *et al.*[6] *C. punctata, T. axei, O. ostertagi, C. pectinata,* and *O. radiatum.* These same species, for the most part, also occurred in numbers far larger than the other 11 gastrointestinal species reported. This is particularly significant because all six are known pathogens and have been incriminated as being responsible for cases of clinical parasitism in Georgia by Andrews *et al.*,[1] and by Bailey and Herlich.[9] Although the observed intensity of infection of *O. radiatum* would indicate this species is relatively unimportant, the writer has observed some severe cases of oesophagostomiasis in southern Georgia.[12]

Although the number of nematode eggs present in a known quantity of feces is often used as a rough index of the intensity of nematode infections in cattle, in the present survey no correlation was found between ova per gram of feces and the total worm counts.

Conditions

All the cattle examined in this study originated from the Coastal Plain Region of Georgia, where the warm, moist climate is favorable to development and survival of preparasitic stages of nematode parasites. The average annual precipitation in this area is approximately 50 inches. Seasonal distribution of this rainfall reveals that it occurs in two peaks, one in the winter and the other in midsummer, separated by dry periods in the spring and fall. In July, the average precipitation is approximately six inches; in January, four inches. Temperatures are mild throughout the year; daily minimum is seldom below freezing. There are frequent periods of warmth during the winter months. The average temperatures in January and July are approximately 52 F. and 80 F., respectively, and the mean annual temperature is around 65 F. Weather records for the 17 month period during which this survey was in progress revealed that the mean annual temperature was nearly normal and precipitation approximately 90% of normal.

Summary

Postmortem examinations for parasitic worms were made on 29 cattle, ranging in age from 6 to 18 months, from the Coastal Plain Region of Georgia. Animals had been slaughtered in abattoirs. The total number of nematodes recovered from the animals of this series ranged from 85 to 22,509; the average number per animal was 4,331. Eighteen species, representing 11 genera, were recovered.

The percentage-incidence of the various species was Haemonchus spp. (*H. placei* and *H. contortus* of Roberts *et al.*[8]), 82%; *C. punctata*, 82%; *T. axei*, 72%; *O. ostertagi*, 72%; *O. radiatum*, 69%; *C. pectinata*, 52%; *H. similis*, 41%; *Setaria cervi*, 34%; *B. phlebotomum*, 28%; *C. bovis*, 17%; Trichuris sp., 17%; *O. lyrata*, 17%; *Gongylonema pulchrum*, 10%; *T. colubriformis*, 7%; *T. longispicularis*, 7%; *C. spatulata*, 7%; and *S. papillosus*, 3%.

Fecal samples from 22 cattle contained 0 to 1,504 nematode eggs per gram. There was no correlation between the number of eggs per gram and the number of gastrointestinal roundworms found in the animals.

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Poultry Disease Research

Kansas State University scientists are battling a poultry disease which eventually may open the door to cancer control in human beings and at the same time save the nation's farmers millions of dollars each year.

The scientists — Dr. M. J. Twiehaus, pathology department head; T. B. Avery, poultry department head; Amos J. Kahrs, poultry farm manager; and James A. Will, pathology graduate student — are probing into the nature of avian leukosis, a disease which causes a $150 to $200 million yearly loss for chicken and turkey raisers. The major type of avian leukosis under scrutiny at K-State is visceral lymphomatosis.

Examining a microscopic slide are Dr. M. J. Twiehaus (seated) and graduate student James Will.

Changes in Serum Proteins of Goats Produced by Moniliasis Infection

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MUCH INTENSIVE STUDY is being accomplished on the subject of *Candida albicans* infection (moniliasis) in human beings and animals. The advent of broad spectrum antibiotics has resulted in a rise in the incidence of moniliasis.[1] Increased use of these antibiotics in treatment, as well as supplemental feeding, of poultry and animals is also of interest.[2]

Following the completion of a study of twenty normal goats' serum proteins by Gorczyca, McCarty and Limon,[3] and based upon a report of field observations of moniliasis in cattle by McCarty,[4] it was felt by the writers that determination of the effect of *C. albicans* infection on the serum protein pattern of the normal goat might be of interest.

Methods and Materials

Animals employed in this phase of the study consisted of five female goats. These were all in control group 1 in the original protein study, and were seven to nine months of age. Breeding was of the mixed type excluding the mohair variety. Diet was pasture only. None of the does was pregnant. All animals were free from external or internal parasites.

C. albicans cultures were obtained from swab specimens taken from cattle exhibiting the effects of yeast infection. Primary isolation was made on Saburouds glucose agar; secondary screening and isolation was made on Tergitol -7 agar; clean colonies were picked and inoculated onto Saburouds glucose agar. Final identification of the yeast organism was made on corn meal agar and through sugar fermentation reactions as outlined by Moss and McQuown.[5] Cultures showing typical reaction for *C. albicans* were selected and cultured into Saburouds glucose acid broth. Inoculates were allowed to grow for four days at 37 C. Growths were then concentrated by centrifugation, pooled, and diluted with sterile 0.9% saline to the turbidity of a no. 5 McFarland standard.

The saline diluted solution (2 ml.) was insufflated intranasally into each goat.

Twenty-one days post treatment, when the animals were exhibiting some of the general physical characteristics of the infection, blood samples were taken from the jugular vein and serum samples were obtained for electrophoretic and chemical studies.

Total protein determinations were made by the Biuret method of Kingsley,[6] and electrophoresis partitions of serum were performed by methods and procedures described in Spinco Model R, Paper Electrophoresis operating instructions.[7] All determinations were accomplished in duplicate.

Experimental Results

Tables 1 and 2, and figures 1 and 2 present data pertinent to this study.

Table 1 presents the tabulation of two normal serum protein determinations prior to the insufflation treatment and of the serum protein determination 21 days post treatment. Normal values* noted were those derived in the original goat serum protein study.

In table 2 a tabulation of differences in percent of total protein is given between the second normal protein determination and the post treatment determination. Total protein concentrations showed variable differences being increased, as well as decreased, and exhibiting no specific trend.

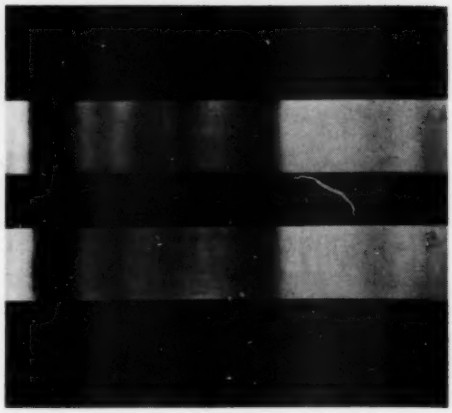


Fig. 1. Comparison of human serum (strip no. 1) and goat serum (strip no. 3) paper electrophoresis patterns. Note the respective number as well as relative mobilities, of the globulin fractions in the two strips.

Albumin fractions revealed a marked change in three goats with predominantly decreased concentrations. Alpha globulin fractions did not exhibit significant variations, with changes ranging from decreased to increased concentrations. Beta-1 and Beta-2 globulins generally showed moderate decreases in concentration. These ranged

TABLE 1. Total Protein and Serum Components of Goats Before and After Infection with *Candida Albicans*

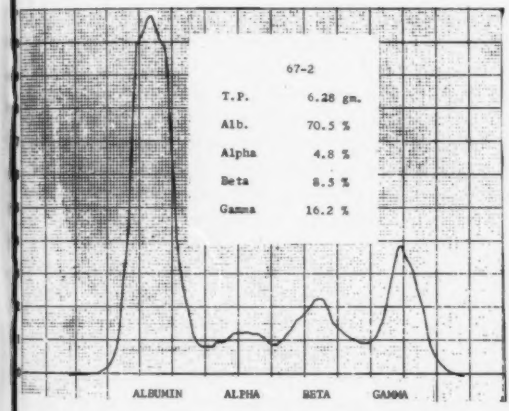
No.	Sex	Total Protein	Albumin		Globulins							
					Alpha		Beta-1		Beta-2		Gamma	
		Gm. 100 cc.	Gm. 100 cc.	conc. %	Gm. 100 cc.	% conc.	Gm. 100 cc.	% conc.	Gm. 100 cc.	% conc.	Gm. 100 cc.	% conc.
59-1	F	6.30	3.96	63.0	0.31	4.9	0.91	14.5			1.12	17.6
59-2	F	6.90	4.40	63.4	0.37	5.4	0.94	13.5			1.19	17.7
59-3	F	5.80	3.29	56.5	0.34	5.9	0.59	10.2			1.58	27.4
66-1	F	6.04	3.38	56.0	0.42	7.0	0.85	14.0			1.39	23.0
66-2	F	6.08	3.93	64.5	0.40	6.6	0.59	9.7			1.16	19.2
66-3	F	6.90	3.18	46.0	0.58	8.4	1.05	15.3			2.09	30.3
67-1	F	6.30	4.30	68.0	0.35	5.5	0.76	12.1			0.90	14.4
67-2	F	6.28	4.45	70.5	0.30	4.8	0.53	8.5			1.00	16.2
67-3	F	6.10	3.60	59.0	0.35	5.7	0.75	12.2			1.40	23.1
69-1	F	6.50	3.90	60.0	0.30	4.7	0.96	14.7			1.34	20.6
69-2	F	6.70	3.96	59.0	0.56	8.4	1.01	15.1			1.17	17.5
69-3	F	6.90	4.25	61.5	0.36	5.2	0.62	9.0			1.67	24.3
73-1	F	6.50	3.64	56.0	0.46	7.1	0.72	11.0	0.54	8.3	1.14	17.6
73-2	F	5.70	3.90	68.5	0.57	10.0	0.57	10.0	0.36	6.3	0.30	5.2
73-3	F	5.70	3.90	68.5	0.45	7.9	0.57	9.9	0.28	4.9	0.51	8.8
*Normal Ranges												
		5.8	3.6	58.0	0.31	5.0	0.59	9.5			0.80	13.0
		6.5	4.4	69.0	0.54	8.5	1.00	16.0			1.18	19.0

from 1.4 to 6.1%. The most significant changes were encountered in the gamma globulin fractions, where increases in concentration ranging from 3.6 to 11.1% were encountered.

Discussion

Although carried out on a limited number of animals, the study in general indicates that some changes occur in the concentration and distribution of serum protein components of goats with moniliasis. Although no clear diagnostic pattern is evident, changes encountered indicate that the systemic response is generally a decrease in albumin.

Figs. 2 and 2A. Analytrol tracings of electrophoretic patterns of Goat No. 67 pre- and post treatment showing the general changes encountered in protein distribution.



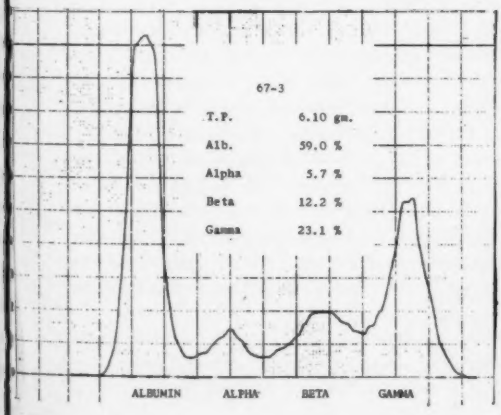


TABLE 2. Changes of Goat Serum Protein Concentrations in Relative Percent of Total Protein, After Treatment with *Candida Albicans*

No.	T.P.	Albumin	Alpha	Beta-1	Beta-2	Gamma
59	—15.8	— 6.9	+0.5	—3.3	—	+ 9.7
66	+13.5	—18.5	+1.8	+5.6	—	+11.1
67	— 2.8	—11.5	+0.9	+3.7	—	+ 6.9
69	+ 2.9	+ 2.5	—3.2	—6.1	—	+ 6.8
71	0.0	0.0	—2.1	+0.1	—1.4	+ 3.6

Calculations were made from the second normal serum and post-treatment sampling serum studies.

There are variable changes in the alpha globulin, decreased beta globulins and increased gamma globulin.

Figure 1 shows typical human and goat sera patterns accomplished by paper electrophoresis. This pattern shows the typical three (3) globulin separation found in the majority of normal animals.

In figures 2 and 2A a comparison is made of the analytrol tracings of the electrophoretic patterns of goat no. 67 showing the pre- and post treatment changes encountered in the various serum protein components. These tracings examplify general pattern changes found in most of the animals. All animals used in this phase of study eventually recovered from the infection. Studies of the effect of moniliasis on serum protein patterns of goats that had been on low dosages of limited and broad spectrum antibiotics, will be presented in a later report.

The presence of beta-2 globulin in goat no. 73, which differs from the three globulin fractionation of the other animals, was commented on in the initial study of goats. This fraction was present in 15% of the normal animals studied and was confined to the female of the species. Reasons for its presence were not determined at this time.

Summary

A study of the effects of a monilia infection on the serum protein concentration, and distribution of components of the serum of goats showed the following:

1. Total protein and alpha globulin changes were variable, showing increased and decreased variations from the normal in the respective animals.

2. Relative total protein percent concentrations of albumin and beta globulins were found generally to be decreased in variable amounts.

3. Gamma globulin was increased in the post treatment testing in all animals, with changes ranging from 3.6 to 11.1%.

4. The study of serum proteins was accomplished by chemical and electrophoretic methods.

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Prophylaxis for Malpractice

The great bulk of malpractice suits in the country are readily preventable, according to Dr. Samuel Polsky, associate professor of law at Temple University and director of the Philadelphia Medico-Legal Institute, writing in the March 11 issue of *Medical News*. "If I were required to state a first principle of preventive law in malpractice action, it would be that diagnostic and surgical skills are less important than establishing a friendly client relationship."

For proof, Doctor Polsky suggests that professional men look at the medical quack. Of the tens of thousands of malpractice suits that fill the law reports, disconcertingly few are directed against the out-and-out medical fraud. The reason is simple: the only skill the quack has to sell is his ability to establish rapport with his patient. Medical skill is absent—and so are malpractice suits.

In most states the statute of limitations for malpractice actions is far shorter than the limitation period for debts. Doctor Polsky suggests that patience in waiting until the limitation period for malpractice has run out will not only restrain suits of a retributive nature, but may result in peaceful payment of a just fee.

As a final step in the practice of preventive law, Doctor Polsky suggests doctors whose clients fail to follow advice should write or tell those clients to find another doctor, or at least that responsibility is on the client if he fails to follow advice.

Selenium: A Trace Mineral

With the continuing advance of mineral nutrition, selenium has attracted special interest in the last year or two. The importance of selenium was first noted by Schwarz and co-workers at the National Institutes of Health. It was reported that selenium is needed in small amounts (approximately 0.05 to 0.2 p.p.m.) in experimental diets low in vitamin E to prevent liver necrosis in the rat.

Proper extension of this idea was pursued by researchers at American Cyanamid, Cornell, and elsewhere. Further studies included the effect of this trace mineral on chickens and swine.

"In chickens small amounts of selenium salts (less than 0.5 p.p.m.) prevent exudative diathesis, and in swine small amounts prevent liver necrosis in the absence of vitamin E. In all animals studied, larger amounts of vitamin E, when fed alone, also overcome the deficiency symptoms."

The major mineral components of a ration such as sodium, potassium, magnesium, etc., along with the level of unsaturated fats, are intimately connected with development of selenium deficiency signs in the chick.

Still of interest in some areas is selenium toxicity. The mineral is toxic in feeds in amounts only 50 to 100 times the essential amount.

At present no justification for supplemental selenium seems to exist.

Controlled experiments indicate that intramuscular injection of a systemic organic phosphate produces satisfactory kills of the larvae of O. ovis. *Further studies are required to establish safety for general use.*

Treatment of Oestrus ovis With Dimethoate

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OESTRUS OVIS, the nasal botfly of sheep, has long been the subject of concern and interest to sheep growers and parasitologists in most areas of the world where sheep contribute substantially to the economy. Many varying opinions have been expressed concerning not only the economic and pathological significance of this parasite, but also the value and efficiency of numerous and often bizarre and radical treatments.

A review of the available literature shows that many attempts have been made to destroy the larval stages of this parasite infesting the nasal cavities and frontal sinuses of sheep. Materials such as carbon disulfide, carbon tetrachloride, tetrachlorethylene, saponated cresol, lindane, and dieldrin have been used. These compounds were administered by injection into the nasal cavities through the nostrils, or directly into the frontal sinuses after surgical perforation of the frontal bones. The materials were effective in destroying some of the larvae, but were generally very irritating to the sheep, and the methods of administration were, by and large, impractical for the treatment of large numbers.

A treatment devised by Cobbett[1,2] and reported in 1940 utilizing a 3% saponated cresol solution introduced through the nostrils under pressure, was extensively used in New Mexico. The interest shown in this treatment by the sheep growers and the large number of flocks to which it was applied demonstrated the need for an efficient method of controlling this parasite.

With the advent of organic phosphate parasiticides, the so called systemics, the possibility of controlling *O. ovis* with these compounds was immediately apparent to the authors. A report on the efficacy of ET-57 (Trolene—Dow Chemical)[3] administered orally as a single treatment was made in 1958. This compound was found to be 100% effective against first instars in 27 of 28 sheep treated, but only slightly effective against second and third instars.

The purpose of this paper is to report the effectiveness of another systemic dimethoate (American Cyanamid)*, against the same parasite.

Materials and Methods

In the six preliminary experiments concerned primarily with establishing an effective nontoxic dose, a 50% injectable so-

*CL 12,880 American Cyanamid: O,o'-dimethyl S-α-mercapto-N-methylacetamidodithio-phosphate supplied by the American Cyanamid Co. through the courtesy of Drs. Emanuel Waletzky and William P. Johnson.

TABLE 1. Effect on Larvae of *Oestrus ovis* of Varying Dosages of Dimethoate Administered Intramuscularly as a 50% Injectable Solution or Orally in Oblet Form

Ear Tag No.	Wt. in kg.	Dosage Rate per kg. and Route to Principals	Dose in ml. or gm. to Principals	Toxic Symptoms* in Principals	No. of larvae recovered: First instars, Nasal Passages, Alive	First instars, Nasal Passages, Dead	First instars, Frontal Sinuses, Alive	First instars, Frontal Sinuses, Dead	Second instars, Nasal Passages, Alive	Second instars, Nasal Passages, Dead	Second instars, Frontal Sinuses, Alive	Second instars, Frontal Sinuses, Dead	Third instars, Nasal Passages, Alive	Third instars, Nasal Passages, Dead	Third instars, Frontal Sinuses, Alive	Third instars, Frontal Sinuses, Dead
Experiment 1, November 4, 1957																
452/583**	52.1/***	20 mg. Oral	12.5 gm.	None	61/41	0/0	0/0	0/0	0/0	0/0	2/1	0/0	0/0	0/0	0/0	0/0
Experiment 2, November 26, 1957																
2888/563	64.4/***	100 mg. Oral	77.6 gm.	Severe	0/77	0/0	0/0	0/0	0/2	0/0	0/1	0/0	0/0	0/1	0/0	0/0
401/570	59.0/***	80 mg. Oral	56.9 gm.	None	0/136	0/0	0/0	0/0	0/8	0/0	0/13	0/0	0/0	0/0	0/1	0/1[c]
404	64.4	60 mg. Oral	46.5 gm.	None	0	0	0	0	0	0	0	0	0	0	0	0
25	52.2	40 mg. Oral	25.1 gm.	None	0	0	0	0	0	0	0	0	0	0	0	0
476	56.7	80 mg. IM	9.0 ml.	None	0	0	0	0	0	0	0	0	0	0	0	0
408	54.4	60 mg. IM	6.5 ml.	None	0	0	0	0	0	0	0	0	0	0	0	0
477	65.8	40 mg. IM	5.2 ml.	None	0	0	0	0	0	0	0	0	0	0	0	0
350	50.3	20 mg. IM	2.0 ml.	None	0	0	0	0	0	0	0	0	0	0	0	0
Experiment 3, December 2, 1957																
425/557	31.1/54.4	40 mg. Oral	15.1 gm.	None	0/5	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
589/495	37.2/43.1	40 mg. Oral	17.8 gm.	None	7†/42	0/0	0/0	0/0	0/0	0/0	0/1	0/0	0/0	0/0	0/0	0/0
585/496	45.4/42.2	40 mg. Oral	21.8 gm.	None	0/97	0/0	0/2	0/0	0/0	0/0	0/13	0/0	0/0	0/0	0/0	0/0
592/554	50.3/42.6	40 mg. Oral	24.2 gm.	None	0/4	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
491/590	25.4/42.6	20 mg. IM	1.0 ml.	None	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1136/587	45.4/39.7	20 mg. IM	1.8 ml.	None	2/13	0/0	0/2	0/0	0/0	0/0	0/0	0/0	0/0	1/0	2/0	0/0
575/578	26.3/39.5	20 mg. IM	1.1 ml.	None	0/79	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
594/551	33.1/42.2	20 mg. IM	1.3 ml.	None	0/13	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Experiment 4, January 3, 1958																
421/492	53.5/44.9	60 mg. Oral	38.7 gm.	Slight	0/31	0/0	0/0	0/0	0/0	0/1	0/4	0/0	0/0	0/0	0/3	0/3
569/565	40.4/34.2	60 mg. Oral	29.2 gm.	Severe	0/7	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
422/493	35.4/38.6	60 mg. Oral	25.6 gm.	Slight	0/22	0/0	0/0	0/0	0/2	0/0	0/6	0/0	0/3	0/1	0/12	0/2
560/558	32.7/38.1	60 mg. Oral	23.6 gm.	Slight	0/86	0/0	0/0	0/0	0/7	0/0	0/2	1/0	0/5	0/1	0/27	0/0
572/553	42.8/32.7	40 mg. IM	3.4 ml.	Marked	0/24	0/0	0/0	0/0	0/0	0/0	0/2	0/0	0/0	0/1	0/0	0/0
500/498	47.2/45.4	40 mg. IM	3.8 ml.	Severe	0/14	0/0	0/0	0/0	0/0	0/0	0/1	0/0	0/0	0/1	0/0	0/0
568/552	38.3/31.3	40 mg. IM	3.0 ml.	Slight	0/9	0/0	0/0	0/0	0/0	0/0	0/1	0/0	0/0	0/1	0/0	0/1[c]
2885/596	42.6/54.0	40 mg. IM	3.4 ml.	Slight	0/6	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Experiment 5, February 3, 1958																
270/233	32.7/30.4	50 mg. Oral	19.7 gm.	Slight	0/15	0/0	0/0	0/0	0/2	2/0	0/6	0/0	0/0	0/1	3/5	2/0
2819/2823	39.4/38.6	50 mg. Oral	23.7 gm.	Slight	0/12	0/0	0/0	0/0	0/4	0/0	0/6	0/0	0/0	0/0	1/4	0/1
562‡/555	42.2/35.4	50 mg. Oral	25.4 gm.	Severe	0/8	0/0	0/0	0/0	0/0	2/0	0/1	0/0	1/0	5/1	1/5	1/1
2825/2818	32.7/43.5	50 mg. Oral	19.7 gm.	Slight	0/28	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/5	0/0
2817/2824	33.6/38.1	30 mg. IM	2.0 ml.	Slight	0/19	0/0	0/0	0/0	0/0	0/0	0/3	1/0	0/2	1/0	0/9	3/0

2819/2823	39.4/38.6	50 mg. Oral	23.7 gm.	Slight	0/12	0/0	0/0	0/0	0/4	0/0	0/6	0/0	0/0	0/0	1/4	0/1
5623/555	42.2/35.4	50 mg. Oral	25.4 gm.	Severe	0/8	0/0	0/0	0/0	0/0	2/0	0/1	0/0	1/0	5/1	1/5	1/1
2823/2818	32.7/43.5	50 mg. Oral	19.7 gm.	Slight	0/28	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/5	0/0
2817/2824	33.6/38.1	30 mg. IM	2.0 ml.	Slight	0/19	0/0	0/0	0/0	0/0	0/0	0/3	1/0	0/2	1/0	0/9	3/0
2816/2820	32.2/34.0	30 mg. IM	1.9 ml.	Slight	0/61	0/0	0/0	0/0	0/0	0/0	0/8	0/0	0/0	1c/0	0/3	4/0
2821/2822	35.8/31.3	30 mg. IM	2.1 ml.	Slight	0/56	0/0	0/0	0/0	0/1	0/0	0/2	0/0	0/2	1/0	0/12	0/0
494/2884	45.4/40.8	30 mg. IM	2.7 ml.	None	0/18	0/0	0/2	0/0	0/0	0/0	1/0	0/0	0/0	0/0	0/0	0/0
Experiment 6*, February 7, 1958																		
564/574	33.6/57.2	50 mg. Oral	20.2 gm.	Slight	0/24	0/0	0/1	0/0	0/0	0/0	0/3	0/0	0/2	0/0	1/3	0/0
559/556	39.5/56.2	50 mg. Oral	23.8 gm.	None	0/67	0/0	0/0	0/0	0/2	0/0	0/6	0/0	0/0	0/0	0/5	0/0
566/571	40.8/57.2	50 mg. Oral	24.6 gm.	Marked	0/46	0/0	0/0	0/0	0/0	0/0	0/6	0/0	0/0	0/0	0/7	2/0
499/450	41.3/46.3	50 mg. Oral	24.9 gm.	Slight	0/25	0/0	0/0	0/0	0/4	0/0	0/0	0/0	0/5	0/0	0/6	0/0
599/2826	38.1/47.2	50 mg. Oral	23.0 gm.	None	0/18	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0
2882/423	37.6/53.5	50 mg. Oral	22.7 gm.	None	0/20	0/0	0/0	0/0	0/0	0/0	0/3	0/0	0/0	1/0	0/14	3/0

* Slight=salivation; marked=salivation and muscular trembling; severe=incoordination and prostration.

** Numerator=data on the principals; denominator=data on the controls.

*** Not weighed.

c Calcified larva.

† Very sluggish larvae deep in folds of ventral turbinates.

‡ Died; head examined 49 hours after treatment.

▾ The sheep in this experiment all examined 120 hours after treatment.

lution and a 15-gm. Oblet containing 1.25 gm. of dimethoate were used. Since the Oblets were not adaptable for the various dosages, they were powdered and the dosage was weighed out and given in capsules.

In experiments 1 and 2 the sheep used were ewes and wethers in good physical condition from the laboratory flock; in experiments 3, 4, and 5, cull range sheep in poor physical condition; and in experiment 6, cull range sheep in somewhat better condition, having been under feed for approximately 3 months. They were all naturally infested. Only the 50% injectable solution was used in the seventh, or final, test, utilizing 60 cull range ewes in poor physical condition, obtained from a sale yard in southeastern New Mexico. They originated from several ranches in the area, and were also naturally infested.

Prior to treatment, each principal was matched with a control from the same flock of origin whenever possible. Each sheep was weighed and individually ear-tagged, and the principals given the drug either orally or intramuscularly (IM). The site of injection was the muscles of the thigh. All animals were sacrificed 72 or 120 hours after treatment of the principals.

The method of examination to determine the results consisted of a detailed search of the mucous membranes of the nasal cavities and frontal sinuses. To expose the nasal cavities, in order to count the larvae, each head was divided sagitally with a saw-cut immediately to the right of the nasal septum, thereby exposing the ethmoid processes, turbinates, and meatuses of the right nasal cavity. The septum was then removed, exposing the corresponding structures on the left side. To complete the examination of all structures, it was necessary to unfold the turbinates. Each frontal sinus was opened by removing the external surface of the nasofrontal part of the frontal bone by a single saw-cut starting at the supraorbital crest and ending in the median plane.

Results

The results of the preliminary experiments are presented in table 1, and those of the final experiment in table 2. To facilitate comparison of tabulated data pertaining to treated and untreated sheep, the values for

each principal and its corresponding control appear on the same line.

Toxicity was observed only in one fat sheep after being given an oral dose of 100 mg./kg. No toxicity was observed in other fat sheep given oral doses of 40, 60, and 80 mg./kg., nor in those given IM doses of 20 40, 60, and 80 mg./kg.

Toxicity developed in sheep in poor physical condition after being given doses as low as 50 mg./kg. orally and 30 mg./kg. IM.

No signs of toxicity were exhibited by any of the sheep dosed IM at the rate of 25 mg./kg. of body weight.

Discussion

Experiment 1. In the first preliminary experiment, four principals and one control were used. The principals were given dosages of 5, 10, 15, and 20 mg./kg. orally. Only one principal (the one receiving the largest dose) and its control were sacrificed. The principal had 61 live first instars and two live second instars; the control had 41 live first instars and one live second instar. All doses were nontoxic and all regarded as ineffective. The remaining three principals were held over and utilized in experiment 2.

Experiment 2. Eight principals and two controls were used. The principals were given, individually, dosages of 40, 60, 80, and 100 mg./kg. orally and 20, 40, 60, and 80 mg./kg. IM. Typical, severe toxicity developed in the one sheep that was given 100 mg./kg. orally; none of the others showed symptoms. All the sheep were killed and autopsied after 72 hours, and all principals were completely free of *O. ovis* larvae. Findings in the controls were quite different. A total of 213 live first instars, 24 live second instars, and one live third instar were found in the controls in this experiment. Since infestation with first instars is almost 100% at this time of year (November), the results suggested that all doses, both oral and IM, were highly effective in destroying first instars of the parasite.

Experiment 3. Since the results of experiment 2 suggested that dosages as low as 40 mg./kg. given orally and 20 mg./kg. given IM were efficient, this point was further tested by using four sheep for each treatment. These and eight untreated con-

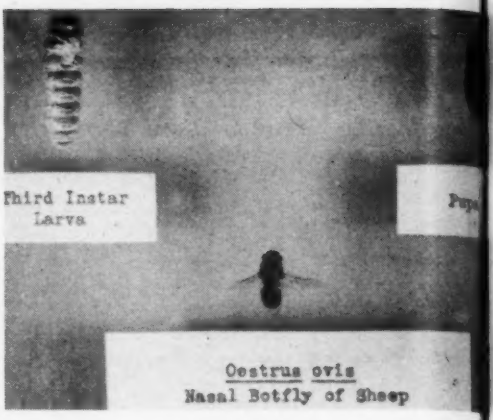

Fig. 1. Three stages in the life cycle of the nasal botfly of sheep, *Oestrus ovis*. The adult fly, third instar larva, and pupa.

trol sheep were killed and autopsied at 72 hours after treatment. Seven live first instars were recovered from the four orally dosed sheep. Two live first instars and two third instars were recovered from the four dosed IM. From the eight untreated controls, there were recovered 257 live first instars and 14 live second instars. No toxicity was encountered, and both doses were adjudged highly effective (although not 100%) against first instars.

Experiment 4. Using eight principals and eight controls, the dosage was increased over that of experiment three in an attempt to achieve greater efficiency. Four sheep were given 60 mg./kg. orally and four were given 40 mg./kg. IM. These were cull sheep in very poor condition, and all were obviously poisoned, but none fatally. At 72 hours, no larvae were recovered from any of the treated sheep, but the controls had 199 live first instars, 25 second instars, and 50 third instars, plus one dead second and ten dead third instars. These results showed the remarkable efficacy of dimethoate against all stages of the larvae, despite the toxicity of the doses used.

Experiment 5. This was a repetition of experiment 4, using eight principals and eight controls in poor physical condition. The dosages were reduced to 50 mg./kg. for those given orally and 30 mg./kg. for those given IM. Toxic symptoms developed in six

TABLE 2. Effect on Larvae of *Oestrus ovis* of 25 mg./kg. of Body Weight of Dimethoate Administered Intramuscularly as a 50% Injectable Solution

Ear Tag No.	Wt. in kg.	Dose in ml. to Principals	No. of larvae recovered: First instars, Nasal Passages, Alive	First instars, Nasal Passages, Dead	First instars, Frontal Sinuses, Alive	First instars, Frontal Sinuses, Dead	Second instars, Nasal Passages, Alive	Second instars, Nasal Passages, Dead	Second instars, Frontal Sinuses, Alive	Second instars, Frontal Sinuses, Dead	Third instars, Nasal Passages, Alive	Third instars, Nasal Passages, Dead	Third instars, Frontal Sinuses, Alive	Third instars, Frontal Sinuses, Dead
Experiment 7, March 3, 1958														
2829/2834*	36.2/33.1	1.8	0/25	0/0	0/0	0/0	0/0	0/0	0/2	0/0	0/0	0/0	0/1	0/0
2831/2833	35.3/29.4	1.7	0/5	0/0	0/0	0/0	0/0	0/0	0/2	0/0	0/0	0/1[c]	0/5	0/0
2830/2832	39.9/38.5	1.9	0/19	0/0	0/0	0/0	0/1	0/0	0/4	0/0	0/2	0/0	0/3	2/1
581/580	56.0/56.2	2.8	0/14	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
595/579	56.6/48.9	2.8	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
567/2887	52.1/43.0	2.6	0/6	0/0	0/1	0/0	0/0	0/0	1/6	0/0	0/3	2/0	2/3	0/0
2858/2870	26.1/28.6	1.3	0/5	1/0	0/0	0/0	0/1	1/0	0/4	0/0	0/0	2/0	1/12	0/0
2863/2869	36.5/34.5	1.8	0/6	0/0	0/0	0/0	0/5	0/0	0/2	0/0	0/3	0/0	0/7	1/0
2905/2855	54.4/64.9	2.7	5/19	0/0	0/0	0/0	0/1	0/0	0/5	0/0	1/0	0/0	1/7	1/0
2846/2874	35.8/34.9	1.8	0/5	0/0	0/3	0/0	0/1	0/0	0/2	0/0	0/0	1[c]/0	0/4	0/1
2919/2909	32.2/33.3	1.6	0/42	0/0	0/0	0/0	0/19	0/0	0/1	0/0	0/5	0/0	1/0**	1/0
2852/2873	31.8/33.6	1.6	0/16	0/0	0/0	0/0	0/3	0/0	0/5	0/0	0/2	0/0	0/2	4/0
2851/2866	27.2/26.8	1.5	0/7	0/0	0/5	0/0	0/10	0/0	0/2	0/0	0/1	0/0	0/7	0/0
2912/2916	34.5/36.1	1.7	0/0	0/0	0/0	0/0	0/0	0/0	0/5	0/0	0/2	0/0	0/2	1/0
2914/2904	29.0/38.6	1.4	0/3	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
2859/2872	34.7/34.5	1.7	0/27	0/0	0/0	0/0	0/2	0/0	0/1	0/0	0/0	0/0	1/0	1/0
2865/2850	39.9/35.8	2.0	0/8	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/1[c]	2/0	2/0
2901/2917	33.9/43.1	1.7	0/20	0/0	0/0	0/0	0/0	0/0	0/3	0/0	0/0	0/1[c]	0/0	0/0
2913/2856	32.2/35.4	1.6	0/24	0/0	0/3	0/0	0/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0
2857/2848	41.3/41.3	2.1	0/13	0/0	0/0	0/0	0/2	0/0	0/2	0/0	0/0	1/0	0/3	0/0
2864/2860	32.2/36.3	1.6	0/15	0/0	0/0	0/0	0/1	0/0	0/0	0/0	0/1	0/1[c]	0/0	2/0
2840/2839	43.3/27.4	2.2	0/10	0/0	0/0	0/0	0/3	0/0	1/5	0/0	2/2	2/0	1/10	2/0
2849/2906	30.1/35.1	1.5	0/27	0/0	0/0	0/0	0/11	0/0	0/4	0/0	0/1	0/0	0/9	2/1[c]
2854/2908	54.0/38.8	2.7	0/24	0/0	0/0	0/0	0/7	0/0	1/2	0/0	0/6	0/0	0/7	2/0
2861/2871	34.9/31.3	1.7	0/3	0/0	0/0	0/0	0/9	1/0	2/0	0/0	0/5	2/0	0/1	0/0
2862/2903	34.2/38.1	1.7	0/26	0/0	0/0	0/0	0/3	0/0	0/2	0/0	0/4	5/0	0/6	1/0
2911/2907	38.1/31.3	1.9	0/17	0/0	0/0	0/0	0/6	0/0	0/9	0/0	0/0	0/0	0/1	0/0
2868/2915	38.1/31.3	1.9	0/26	0/0	0/0	0/0	0/2	1/0	0/1	0/0	0/1	1/0	0/15	0/0
2867/2847	38.1/26.5	1.9	1[d]/17	0/0	0/0	0/0	0/3	0/0	0/3	0/0	0/3	0/0	0/9	1[c]/3[ci]
2910	39.9	2.0	0	0	0	0	0	0	0	0	0	0	0	0
2918	38.3	1.9	0	1	0	0	0	0	0	0	0	3[cp]	0	0
Totals			6/429	3/0	0/12	0/0	0/91	3/0	5/72	0/0	3/41	20/4	9/114	23/6
Avg. no. living larvae, each instar			0.19/15.21				0.16/5.62				0.39/5.34			

* Numerator = data on the principals; denominator = data on the controls.
** Mucous membranes edematous, with foramen leading to sinuses occluded.
c Calcified larva.
ci One of these larvae was calcified.
cp Calcified with pus.
d Very nearly dead. No movement visible except under dissecting scope.

vided as to groups), and one animal died at 49 hours. No first instar larvae remained in the principals; 219 were recovered from the controls. Second and third instars numbered one and six respectively in the treated sheep as compared with 33 and 57 in the untreated. This experiment bore out the high efficiency of the treatment, but the doses were also too high for sheep in poor condition.

Experiment 6. Six principals, also in poor condition, were given 50 mg./kg. orally to test this dosage further; six controls were also used. The interval from treatment to autopsy was increased from 72 to 120 hours. No live first or second instars and only one third instar were found in the treated sheep, as compared with 201, 24, and 42 respectively in the controls. Three of the six sheep developed toxic symptoms.

Experiment 7. The 31 principals in this final experiment were given 25 mg./kg. IM. When examined for larvae 72 hours later, they harbored a total of six first instars, five second instars, and 12 third instars. In the 29 controls, 441 first instars, 162 second instars, and 155 third instars were found. The corresponding averages per animal for the principals were 0.19, 0.16, and 0.39, and for the controls 15.21, 5.62, and 5.34. The percentages of the first, second, and third instars killed by the treatment were 98, 97, and 92 respectively. The total number of living larvae in all stages of development in the treated sheep was 23 as compared with 759 in the untreated controls. The average per treated sheep was 0.74 and for the untreated controls 26.17, giving an overall percent kill* of 97.

Although no toxicity was observed in any of the sheep in this final test, toxic symptoms typical of organic phosphorus poisoning were encountered in the preliminary tests on very thin sheep at dosages of 30 mg./kg. given IM (three out of four sheep) and of 50 mg./kg. given orally (six out of ten sheep). Fat sheep showed no toxic symptoms at 80 mg./kg. given IM or orally.

All animals in these tests were exposed to a natural infestation. Therefore, the number of living larvae found in the controls represented the typical parasitic population; the number of dead larvae, the natural mortality. The living larvae found in the principals were those that survived the treatment for 72 hours, while the dead larvae represented the normal mortality plus those killed by the treatment, but not expelled or disintegrated before the examination.

Fig. 2. Left half of the skull with frontal sinuses opened showing third instars (*O. ovis*) in the sinuses. Black larvae developed to stage of emergence.

Fig. 3. Right side of the same skull showing third instars (*O. ovis*).

During the interval between treatment and examination, most of the larvae killed by the treatment were either expelled or disintegrated, making it impossible to obtain an accurate count of those so killed. Therefore, the evaluation of the treatment was based upon the difference between the num-

*Percent kill: $\frac{\text{Avg. no. of living larvae in untreated - Avg. no. in treated}}{\text{Avg. no. in untreated}}$

ber of living larvae in the two groups.

Dimethoate is at present released for experimental purposes only, and no recommendations are made for its general use. The results indicate a high degree of effectiveness against all stages of the larval form of *O. ovis*, and further experimental trials under proper supervision are suggested in areas where the elimination of this parasite is desirable.

Summary

In six preliminary experiments, 72 adult sheep (principals and control) were used to determine an effective, nontoxic, and easily administered dose of dimethoate (O,O'-dimethyl S-α-mercapto-N-methylacetamidodithiophosphate). Oral doses ranged from approximately 5 to 100 mg./kg. Intramuscular doses, using a 50% injectable solution, ranged from 20 to 80 mg./kg. An IM dose of 25 mg./kg. was determined to satisfy all the requirements.

In the final test, 31 of 60 cull range ewes, naturally infested with larvae of *O. ovis*, were given a single IM injection of dimethoate as a 50% injectable solution at the rate of 25 mg./kg. The remaining 29 sheep served as untreated controls. No toxic symptoms were observed in any of the sheep treated at this dosage level. An evaluation of the results 72 hours after treatment showed that 98% of the first instars, 97% of the second instars, and 92% of the third instars were killed in the treated sheep. The over-all percent kill was 97. The treatment must be studied further before it can be regarded as safe for general use.

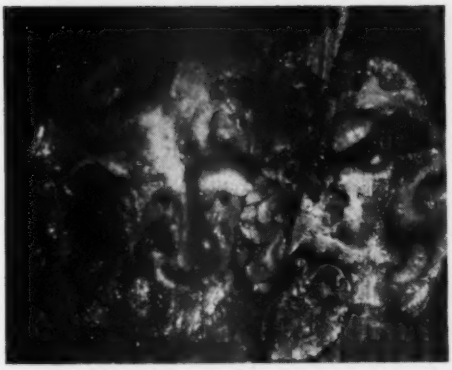

Fig. 4. Left half of the skull opened showing third instar larvae in sinuses. In opening the sinus, the saw cut was slightly too deep, exposing the brain.

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Animal Inspection and Quarantine

An informative point in the *Veterinary Record* of March 28, 1959 in an article by Dr. L. C. Heemstra, director, Animal Inspection and Quarantine Division, USDA, deals with inspection and quarantine of imported animals as follows: "A question has been raised . . . as to the position of the United States in regard to the importation of semen from infected countries. Studies have shown that the virus of foot-and-mouth disease may be contained in the semen of bulls infected with the disease. There are as yet no known procedures or technics which would render semen safe from the hazard of foot-and-mouth disease contamination, should any virus be present in the semen at the time of collection. The deep-freeze technic now employed in the storage and transportation of semen would actually preserve the virus. Semen is a living product intended for direct use in susceptible animals. Accordingly, we must consider semen to be in the same category as the donor animal. If the donor animal is prohibited entry, the semen is likewise prohibited."

Books reviewed in this department and any other books, if available, may be obtained by remitting published price to the Book Department, VETERINARY MEDICINE, Suite 803 Livestock Exchange Building, Kansas City 2, Missouri.

Practitioner's Bookshelf

PET BOOK, by *A. Barton, B.S., D.V.M.*, 128 pages; illustrated; Hart Publishing Company, 74 Fifth Avenue, New York, New York, Publisher, 1958. Price—(Softbound) $1.; (Clothbound) $2.75; (Buckram Bound) $3.75.

EDITOR'S NOTE: *Since the* PET BOOK *noted above was written for children between 10 and 15 years of age, the editors gave the task of writing a review to Miss Judy Wilson, a 15 year old student from Independence, Missouri.*

The relationship between a child and his pet can be a very happy one, indeed, if special care is taken to choose the right kind of pet. This is true in picking out a puppy, a kitten, goldfish, or a pony.

No one can say for certain which type of pet is the most suitable for any particular child since this is something that time must tell. But in putting some of his knowledge about animals into *Pet Book*, Doctor Barton has provided for children a reference of useful and interesting material concerning the choice, care, feeding and training of the most common pets that they would pick for their very own.

Probably many people do not realize that there are about 112 recognized breeds of dogs in our country, plus various breeds that are not recognized for registration purposes. There are five common breeds of cats and approximately 17 types that are infrequently seen. This shows why choosing a favorite puppy or kitten can be very difficult.

Cats and dogs are not the only popular pets. Many children may want to take tropical fish, small birds, rabbits, turtles or one of many others. Whatever the choice of a child, it is an important one, and *Pet Book* is an invaluable help in choosing and caring for the pet.

Doctor Barton, the author of *Pet Book*, is a veterinarian. The information he has passed on in this book can be relied upon to be correct. The book itself would be excellent for the waiting room in a veterinarian's office.

PROCEEDINGS, SIXTY SECOND ANNUAL MEETING OF THE UNITED STATES LIVESTOCK SANITARY ASSOCIATION: 403 pages. United States Livestock Sanitary Association, Publisher, 1959. Price—$5.

Each year a Proceedings Book is published by the United States Livestock Sanitary Association which contains all papers presented, committee reports, and discussions, together with group actions taken. This book is distributed only to members, official and individual. Individual membership is open to veterinarians who are also urged to take part in discussions. The annual official proceedings, complete, comprehensive carefully edited, printed and bound, are easily worth the membership fee of $5. Those interested are urged to contact Dr. Ralph A. Hendershott, 33 Oak Lane, Trenton 8, New Jersey.

Veterinarians Meet in Kansas City

FOR the first time this year, an annual meeting of the American Veterinary Medical Association will be held jointly with another veterinary organization. The Third Pan American Veterinary Congress will hold a meeting in Kansas City and the scientific program of the Pan American Congress will be incorporated with A.V.M.A. presentations.

The United States Department of State has notified the Latin American countries of the Pan American Congress through official channels, thus giving governmental sanction and recognition of the profession in the western hemisphere.

The Third Pan American Congress is expected to push attendance at Kansas City Missouri to over 4,500 registrants.

The winner of the Science Youth Award will display his exhibit at the joint meeting.

Concluded on the next page

Titled "Internal Parasites of the Dog," the project was developed by Wilhelm Delano Meriwether, 16, while employed during last summer and after school by Dr. R. L. Willis, Charleston, S. C., veterinarian.

One of 320 finalists from regional science fairs all over the United States, Canada, Germany, Japan and Puerto Rico, Wilhelm's exhibit was selected by Drs. T. C. Jones and C. H. Cunningham, member and secretary respectively of the A.V.M.A. Council on Research, serving as judges for the veterinary profession.

Since 1942, the A.V.M.A. has offered a trophy for the winning golf team representing an A.V.M.A. Constituent Association.

The Hillcrest Country Club in Kansas City will be the site for this year's competition on Monday afternoon, August 24.

Two-man teams representing their Constituent Association may register in advance by writing: Chairman, Golf Committee, Dr. L. T. Hopkins, 5837 Highland Avenue, Kansas City, Missouri.

Green fees, bus to and from the golf course and Hotel Muehlebach, and a post tournament social hour come to $7.00. Caddies or electric carts are available at the club at the individual's expense.

Prizes, consisting of credit cards for the pro-shop at the club, will be offered for individual competitors and also for the bridge game which will be held at the clubhouse for ladies who prefer not to play golf.

Mr. Dogdom of America

At the traditional Fido Breakfast held annually in New York City, Captain Will Judy of Chicago was awarded the Fido as Dogdom's Man of the Year for 1958. This symbolic dog is the canine counterpart of the Oscar of the movies.

Captain Judy, born in Pennsylvania in 1891, was educated for the ministry, headed a law firm in Chicago, won the silver star in France in World War I, and then "went to the dogs" as publisher and editor of *Dog World* magazine, a job he retired from recently after 36 years. However, he still remains president of his original book firm, the Judy Publishing Co.

Abbott Promotes Parker

Max Parker of Abbott Laboratories has been promoted to Assistant Manager of the Veterinary Division, according to company announcement.

Parker joined Abbott in 1954 as a professional service representative in Salt Lake City. He came to North Chicago in July, 1957. He was graduated from Utah State University and then did three years of graduate work at the Colorado State College of Veterinary Medicine. He served in both World War II and the Korean War.

"Dobbin" and "Pony" Awards

Winners of the "Dobbin" and "Pony" awards for top sales records in the veterinary field are Roy E. Gade, second from left, and Peter Kelly, third from left, at annual meeting in New York City held by Veterinary Department, Winthrop Laboratories. It marked the second time that Mr. Gade received the "Dobbin" for best performance. Shown with winners are Dr. Theodore G. Klumpp, Winthrop president, left, and Dr. Charles E. Fanslau, director of the Veterinary Department.

Veterinary interest in professional management of money matters has promoted the editors of VETERINARY MEDICINE *to seek out experts in the field for a series of reports. This is the sixth and final report on investments and managements of funds for future security.*

Management—Key to Successful Investing

WALTER L. MORGAN

President, The Wellington Fund
Philadelphia, Pennsylvania

PROFESSIONAL MANAGEMENT is one of the principal reasons for the growth of mutual funds since the end of World War II. According to a recent survey by the National Association of Investment Companies, shareholders feel that "management" is one of the primary advantages in owning fund shares.

Mutual funds, in effect, are investment specialists. Just as veterinarians provide an invaluable specialized service for the livestock industry and pet owners, so mutual funds provide a specialized service for people who have neither the time nor the inclination, the skill nor training required to manage their own money

What is a mutual fund's management's job? It is simply to supervise the fund's investment program in keeping with its fundamental policies and objectives. For example, a policy of balanced diversification means that resources are spread over a large number of common stocks, preferred stocks and corporate and government bonds. The amounts of each of these categories are changed in accordance with the management's appraisal of current and prospective economic conditions and the outlook for stock prices.

The management of a fund is typically undertaken by a separate company, closely identified with the fund. In most cases the officers of the fund are also the officers of the management company.

Guiding Investment Policy

The Wellington Company has an Investment Committee which is divided into a policy group and a program group. The policy group, comprised largely of the senior officers of The Wellington Company, guides the fund's overall investment policy in accordance with its fundamental objectives. In its regular meetings, the group recommends investment policy for the fund, including the amounts invested in bonds, preferred and common stocks, and in each industry. By adjusting the fund's investments to current and prospective conditions, the policy group has the basic responsibility for the achievement of the fund's long-term investment objectives.

Carrying Out Decisions

The program group is made up of officers of the investment management division and senior members of The Wellington Company research staff. Its job is to carry out the fund's investment policy by recommending the selection of individual securities for the investment program as well as the increase or reduction of the holdings in each security owned by the fund. The program group keeps up to date on changing conditions, and carefully appraises the outlook for individual industries and companies.

These men are especially trained to get the facts about business, appraise stocks and bonds, and analyze this information in a never-ending search for sound investment values. Each specialist on the staff supervises the research in a group of related industries, and maintains a comprehensive and current research study on the individual companies in each industry. These men travel extensively, interviewing top officers of industrial companies, to keep up to date on their operations and prospects. Many executives also visit the Company periodically to keep the staff current on their business.

Comprehensive Information

This field work of the research staff is greatly aided by information received from more than 50 consultants and contacts, including economists, industry specialists and research organizations, who constantly furnish information.

The constant flow of information received from all sources is checked, analyzed and appraised at staff meetings. The staff transmits its recommendations to the officers of the Investment Management Division for review, before they are submitted to the Investment Committee.

Complete Management at Moderate Cost

Many thousands of man-hours go into selecting securities owned by a mutual fund. Investment management is no easy job. It requires an organization that an individual could scarcely afford. Since leading mutual funds represent the combined invested savings of many thousands of individuals, management costs are unusually low on a unit basis.

Mutual funds publish regular quarterly reports which give their shareholders an up-to-date review of investment policy and their long-term record of achievement. The prices of leading mutual funds are published in the paper each day, so that you can see for yourself the exact unit value of a fund's shares, which in turn is based on the value of investments the fund owns and is therefore a measure of the management's relative success. Each mutual fund has a prospectus which provides important facts about the fund including the amount of sales charge, financial statements and a ten-year record of investment results.

It is important, of course, to compare managements with similar policies to each other, i.e., balanced funds are one group, but there are also common stock funds emphasizing growth and/or high income, funds specializing in different industries and many others. Leading investment brokers and dealers and their representatives are also well-equipped to help you in the choice of a mutual fund that best suits your own personal financial circumstances and objectives — a mutual fund that can give you the kind of experienced professional management that we believe is the key to successful investing.

Continued growth of the mutual idea has been of signal importance to the nation's economy.

Pennsylvania Receives Grant

The University of Pennsylvania School of Veterinary Medicine has been awarded a grant of $4,071 by the Cooperative Grange League Federation Exchange of Ithaca, New York, for research in mastitis.

The grant will be used by Dr. Monica Reynolds, assistant professor of physiology at the veterinary school, to continue and expand her study of blood circulation in the cow's mammary gland. It will make possible the purchase of both diseased and healthy cows necessary for her research.

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with NEOJEL

PATENT PENDING

Amylose Complex Injectable Iron for the treatment and prevention of iron deficiency in baby pigs.

Here's what you have been waiting for in an injectable iron.

***INCLUDES VITAMIN B_{12}, B_6, ZINC and COBALT.** A special synthesis of an amylose complex permits the inclusion of Zinc and Cobalt. These extras in Feraject's exclusive formula aid in faster growth and disease resistance.

***NO LOCAL REACTIONS** due to controlled utilization, Feraject causes no local reactions. Improved viscosity permits ease of injection under all field conditions.

***ELEMENTAL IRON** Feraject contains the equivalent of 100 mgs. of elemental iron as an amylose-iron complex ** per each 2cc. It's the elemental iron equivalent that counts in an iron injectable . . . and Feraject has an adequate supply.

***DOSAGE-AVAILABILITY** Feraject is to be administered intramuscularly in the ham; phophylactic dose, 1 to 2cc. Therapeutic dose, 2cc. Available in 30cc and 100cc vials.

** Pat. Pend.

PH-2-F1

FERAJECT WITH NEOJEL IS COMPLETELY NEW AND DIFFERENT . . . AVAILABLE TO VETERINARIANS EXCLUSIVELY

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DES MOINES . IOWA

Classified Advertisements

Twenty-five words or less, $3.50 — minimum charge; additional words 10 cents each. Replies sent care VETERINARY MEDICINE. 50 cents additional to cover forwarding postage. Remittance must accompany order.

Names of classified advertisers using V. M. key numbers can not be supplied. Address your inquiry to key number care VETERINARY MEDICINE, Suite 803, Livestock Exchange Building, Kansas City 2, Missouri, and it will be promptly forwarded to the advertiser.

Deadline for copy — 5th of month preceding date on issue.

For Sale

MIDWEST MIXED PRACTICE: 80% dairy and hogs. Includes home, hospital, all drugs and equipment. $10,000 to handle. Other interest. Address Box 574, care VETERINARY MEDICINE.

DOG BOOKS: Write us. For doggy selections, prose and poetry, all literatures, Scrapbook & Anthology, $3.50. Training, $3. Judy Publishing Company, 2517 Michigan Blvd., Chicago 16.

DAIRY CATTLE PRACTICE: In Central Minnesota. Real estate, equipment and drugs. Address Box 576, care VETERINARY MEDICINE.

LONG ESTABLISHED PRACTICE: In Arizona. Large and small animals. Selling home and equipment. Owner wishes to retire. Persons interested may come live and work with owner on a 30-day trial basis. Address Box 577, care VETERINARY MEDICINE.

VETERINARIAN PRACTICE: Located in a central Wisconsin city surrounded by very good agricultural area. Hospital, complete with all equipment, instruments, fixtures, medicine and drugs, furniture, etc. Good modern, light and spacious quarters. One story building with oldest part built in 1947. New addition built to accommodate increased business is 2 years old. Office, reception room, equipped operating room, general care room, clipping room, small animal bath, 3 kennel rooms, outside runs, etc. An exceptionally good, lucrative practice priced right for quick sale. For complete details, free brochures are available upon request. Contact Thorp Listing Service, Thorp Finance Corp., Licensed Real Estate Brokers, R. J. Tolford, Salesman, Thorp, Wis.—Phone: NOrth 9-5551.

Wanted

VETERINARIAN: Active managership, veterinary hospital, near Chicago, on partnership basis. No capital. Write Box 575, care VETERINARY MEDICINE.

For Lease

BUILDING: Suitable for veterinary hospital—30 dog capacity, 2nd floor apartment and 20 acre suburban tract, 150 dog boarding capacity; pet cemetery, 2 residences. Write Mrs. D. S. Prugh, 309 Dellwood Ave., Dayton 9, Ohio.

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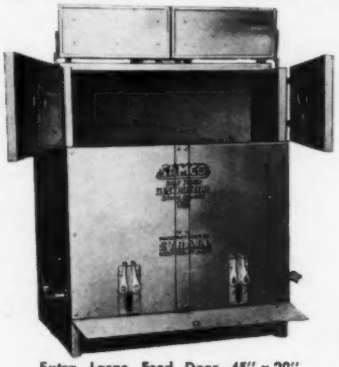
CREMATORY DESTRUCTOR

Gas Fired for

ANIMAL CARCASS CREMATION

(Engineered Special for Veterinary Practitioner)



Extra Large Feed Door 45" x 20"
Capacity 17 Bushel — 2 Burners

100% SAFETY AUTOMATIC THERMO PILOT VALVE

Each Main Burner with Pilot Light and Timer Shut-off.

GREAT HEAT and FIRE POWER

Smaller Sizes Available

Investigate unique purchase plan for great savings

SYRALL MFG. CO., 511 N. State, Syracuse 3, N.Y.

Examination

State Board examinations for Rhode Island will be held on the second Tuesday and Wednesday in July, July 14 and 15, 1959, in Room 505 Veterans' Memorial Building, Providence, Rhode Island. All applicants must procure applications for above examination.

Newcastle Research

Proline, an amino acid or protein building block, makes chicks grow faster, it has been reported by University of Wisconsin poultry researchers. Tests revealed that chicks receiving 0.5% to 2% supplementary proline in their diet weighed 10% to 40% more than chicks on standard rations. Since it is not practical to add proline in a pure form to poultry rations, a method for increasing proline content in chick feeds by adding natural feedstuffs is still to be found.

Pitman-Moore Names Exec.

Dr. R. Victor Johnston has been named director of the veterinary medicine department by Pitman-Moore Company.

IN MILK FEVER . . .

TO RAISE AND MAINTAIN CALCIUM LEVELS . . .

CALSEM® + PARTEROL®

Calsem-DM presents a stable solution containing calcium gluconate 20%, dextrose 20%, calcium glycerophosphate 2%, magnesium chloride 2%; in water, with stabilizer and preservative. As replacement therapy, Calsem-DM supplies an effective concentration of calcium until Parterol takes effect.

Parterol is an oil-soluble steroid which raises the blood calcium level following parturition. It acts by mobilizing calcium stored in the bones and by increasing the absorption of calcium from the intestinal tract.

One clinical study of 328 cases of milk fever showed that calcium I.V. and Parterol I.M. were effective in 98% of the patients.[1]

SUPPLIED:

Parterol in 30 cc. multi-dose vials, each cc. containing 2.5 mg. dihydrotachysterol in oil.

Calsem, *Calsem-D* and *Calsem-DM* in 500 cc. vials.

1. Harris, J.R., and Clarkson, T.B., Prevention of Relapses in Milk Fever, Vet. Medicine, *12*:696 (Dec. 1955)

Write for detailed literature.

THE S. E. MASSENGILL COMPANY

BRISTOL, TENNESSEE

NEW YORK KANSAS CITY SAN FRANCISCO

This department will announce each issue new therapeutic tiems, equipment, services, and literature of interest to veterinarians. All claims made are those of the firms concerned. Send communications to the address noted.

Reader's Service

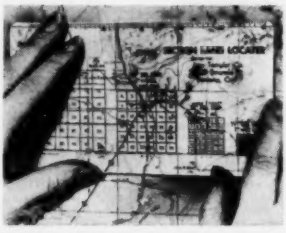
Thin Wall Needles featuring gold-plated hubs for easy recognition are used for the introduction of Ranfac's autoclavable polyvinyl tubing directly into the vein. The needles are available in nine gauges from 14 to 23, in any length, and are made with or without stylets. For a 12 page catalog of the complete line of surgical products ask Randall Faichney Corporation, 299 Marginal Street, Boston 28, Massachusetts.

A granular powder called **Soluble Lactates Mix** has been developed for treatment of ketosis. Designed to be added as a feed supplement, it can also be embodied in a drench. For details check with Sheffield Chemical, Norwich, New York.

Liquamast designates a product specifically designed to combat the problems of mastitis. It is oxytetracycline hydrochloride in propylene glycol and water and is completely soluble. For price and more information, check with Pfizer, 800 Second Avenue, New York 17, New York.

Kem-Dip, used successfully last year by the veterinary profession for control of resistant brown dog ticks and fleas, is now being produced and sold in a new formulation which gives a much increased speed of kill. For most infestations this new formulation will enable veterinarians to treat dogs for brown dog ticks, including the engorged forms, and release the dogs to their owners free of ticks on the same day as treatment. For additional information, write Vet-Kem Laboratories, P. O. Box 14231, Dallas 34, Texas.

Transparent Plastic Template instantly locates any section of land on township drawn maps. Fits eight most commonly used map scales, four on each template. Convenient sizes fit pocket or ring binder. The item



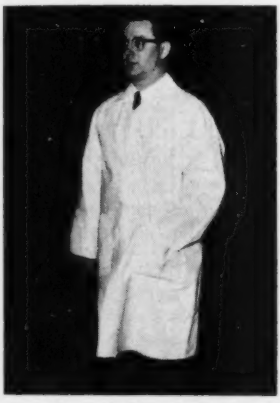
Jero Templet Co.

can be of use to the practitioner with widely scattered clients. Price—$3.75 per set from Jero Templet Company, 8549 Emerald Street, Fontana, California.

Diathal designates a highly effective antidiarrheal compound which has cleared diarrhea in 95% of the clinical cases of large and small animals in clinical trials. It is fast acting and produces excellent results after three days of therapy. Diathal prevents further rapid dehydration of tissues caused by diarrhea. Its blocking activity on spastic contractions permits rest and remission of inflammation of the intestinal wall, hastening return of normal digestive functions. For details ask Schering Corporation, Bloomfield, New Jersey.

A new film describing **Hazards in the Use of Anesthetics** and ways of preventing accidents has been produced for the medical profession under an educational grant from Abbott Laboratories. Entitled *Fire and Explosion Hazards from Flammable Anesthetics,* the film surveys potential sources of ignition, such as incandescent surfaces, open flames, and arcing electrical equipment. The role of static electricity in causing ignition is examined in detail. In sound and color, the 16-mm. film runs approximately 29 minutes. It is available on short-term loan from Film Service Department, Abbott Laboratories, North Chicago, Illinois, without charge.

Disposable Protective Garments, made from Kaycel material, a bonded, non-woven material produced by Kimberly-Clark Corporation, is now available from the Ace High



Williamson-Dickie Mfg. Co.

Division of Williamson-Dickie Manufacturing Co., Fort Worth, Texas. The low-cost, throwaway garments are suitable for a wide variety of uses by veterinarians.

Diuril designates an exceptionally potent, orally effective diuretic now available for use in canine practice. Manufacturer's claims indicate that it represents a new and different approach to treatment of congestive heart failure, renal edema and hepatic ascites. It has low inherent toxicity. Product is produced by Merck & Company, Rahway, New Jersey.

DID YOU KNOW

BIO LABORATORIES HAS A COMPLETE LINE OF SMALL ANIMAL BIOLOGICS

WELL, THEY DO... AND WHAT'S MORE, THEY TAKE A CONSIDERABLE AMOUNT OF CARE IN PRODUCING A FIRST-CLASS LINE OF BIOLOGICS TO EFFECTIVELY MEET YOUR VETERINARY NEEDS.

ANTI CANINE DISTEMPER AND ANTI INFECTIOUS CANINE HEPATITIS AND ANTI LEPTOSPIRA CANICOLA SERUM (TRIPLE SERUM) in 100cc vials.
CANINE DISTEMPER VACCINE — Modified — Live Virus—Chick Embryo Origin—Desiccated in 1 and 5-1 dose cartons.
CANINE DISTEMPER VACCINE—Modified Live Virus—Chick Embryo Origin—Desiccated and Infectious Canine Hepatitis Vaccine Canine Tissue Origin **(DH[1])** in 1 and 5-1 dose cartons.
CANINE DISTEMPER VACCINE AND INFECTIOUS CANINE HEPATITIS VACCINE IN B.S.T. BACTERIN (POLYGEN) in 6-5cc and 50cc vials.
FELINE DISTEMPER VACCINE—Feline Tissue Origin—Desiccated in 2-1 dose cartons.
RABIES VACCINE—Modified Live Virus—Chick Embryo Origin—Desiccated in 1, 5-1 and 10 dose cartons.

BIO LABORATORIES
Kansas City, Kansas
BIOLOGICALS FOR VETERINARIANS

NEW IMPROVED GLUCOCORTICOID WITH OPTIMAL DURATION OF ACTION

Ultracortenol®

(prednisolone trimethylacetate CIBA)

The result of an intensive search for a longer acting steroid, Ultracortenol exerts greater therapeutic effects following a single injection than other cortisone derivatives.[1] It provides a duration of action that is "just right"—not so short-lived as to produce uncertain results, nor so prolonged as to induce complications (such as undue suppression of lactation).

EASIER AND MORE ECONOMICAL TREATMENT OF SMALL AND LARGE ANIMALS

Ultracortenol has been extensively tested and enthusiastically accepted by a number of small- and large-animal practitioners[1-10] who found the following regimens to be highly beneficial:

DAIRY COWS	
Ketosis (acetonemia)	Single 100- to 200-mg. injection.*
Shock ("downer" cow) syndrome	Single 200-mg. injection as supportive therapy.
DOGS	
Dermatoses	5 mg./10 pounds body weight, total single dose not to exceed 20 mg. For sustained therapy, repeat once or twice a week as indicated.
Inflammatory joint conditions	5 mg./10 pounds body weight, total single dose not to exceed 20 mg. Supportive oral therapy not necessary.

*This initial injection may be reduced to 50 to 100 mg. intramuscularly if simultaneous administration of intravenous glucose is given, thus permitting more economical glucocorticoid therapy. If necessary, either regimen may be augmented by an additional injection of 50 to 100 mg. Ultracortenol after 24 to 48 hours. IMPORTANT: Milk from treated cows should be discarded or used for purposes other than human consumption for at least 24 hours after the last treatment.

SUPPLIED: Multiple-dose Vials, 10 ml., each ml. containing 10 mg. or 25 mg. of prednisolone trimethylacetate in suspension for injection.

ULTRACORTENOL is available from ethical veterinary distributors throughout the United States.

References: 1. Vigue, R. F.: J.A.V.M.A. 133:326 (Sept. 15) 1958. 2. Shaw, J. C.: Personal communication. 3. Pollock, S.: Vet. Med. 54:97 (Feb.) 1959. 4. Rabin, P. H.: Personal communication. 5. Hoffer, S. H.: Personal communication. 6. Weir, H. T., and Hazelrig, J. W.: Personal communication. 7. Beck, J. W.: Personal communication. 8. Bull, W. S.: Personal communication. 9. Fessenden, P. E.: Personal communication. 10. Lohmeyer, C.: Personal communication.

C I B A Effective Veterinary Drugs, Products of Exacting Research 2/3660VM
SUMMIT, N. J.

Pitman-Moore Names V. P.

John R. Jewett has been named vice president, assistant to the president, of Pitman-Moore Company.

John R. Jewett

Jewett joined the Indianapolis pharmaceutical firm in 1948, engaging in market research activities. He became assistant to the executive vice president in 1953 and was named assistant secretary in 1957.

"CAP-CHUR" EQUIPMENT

Automatic projectile type syringe delivered by a specially designed pneumatic rifle.

Excellent for immobilizing, capturing, restraining or treating wild or feral animals.

Effective for animals of all sizes. From one to ten milliters of any liquid compound can be injected into an animal from distances up to approx. 50 yards.

Reasonably priced. Write for complete information.

PALMER CHEMICAL & EQUIPMENT COMPANY, INC.

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INJURED TEATS
SCAB TEATS
STENOSIS
POST-OPERATIVELY

To maintain unrestricted milk flow and provide medical antisepsis are of prime importance in treating teat troubles. Dr. Naylor Dilators accomplish these 2 objectives specifically with this 2-WAY ACTION:

1. MECHANICAL ACTION . . . gently supports sphincter and teat mucosa—keeps teat open and promotes easier, natural milking. Positive retention in small or large teats.

2. MEDICAL ACTION . . . *Sulfathiazole* released slowly from within the Dilator provides broad antimicrobial protection; combats infection and reduces swelling; minimizes ascending inflammation and promotes healing.

WITH ANTIBIOTICS . . . Saturated with your favorite udder infusion antibiotic, Dr. Naylor Dilators are an ideal vehicle for additional local medication following teat surgery.

Available from your ethical supplier or write Dept. "P"

H. W. NAYLOR CO., Morris, N. Y.

Dr. Naylor

Medicated
Teat Dilators

SUPPLIED:
Dispensing vials—16's
Labled packages—45's

RE-PEL

PROTECTS HORSES FROM ANNOYING HORSE FLIES

Keep horses and show stock protected from annoying horse flies, stable flies and other tormenting insects. Pro-Brand RE-PEL sets up a protective shield that repels all flies. One application lasts up to 48 hours and longer. Order Pro-Brand RE-PEL, the non-toxic easy-to-use repellant, now!

PRO-BRAND PRODUCTS CO.
FORT WORTH 6, TEXAS

To Head Nutrition Conference

Dr. W. E. Poley, Director of Nutrition, Zip Feed Mills, Sioux Falls, South Dakota has been named chairman for the Second

Dr. W. E. Poley

Annual Midwest Veterinary Nutrition Conference to be held at the President Hotel, Kansas City, Missouri, November 30 and December 1, 1959. State Veterinary Medical Associations are cooperating.

tested medicinals direct by mail

10cc Procaine Penicillin — Aqueous Suspension 300,000 Units per cc Standard Brand Expires February 1960	10 Vials	$ 3.10
	100 Vials	26.00
	1000 Vials	240.00
10cc Procaine Penicillin — 400,000 Units with ½ gm. Dihydrostreptomycin in each 2 cc Aqueous Suspension Standard Brand Expires September 1959	10 Vials	6.00
	100 Vials	55.00
	1000 Vials	500.00
100cc PFIZER Procaine Penicillin aqueous suspension 300,000 Units per cc expires January 1961	1 Vial	2.70
	5 Vials	12.50
	10 Vials	24.00
	100 Vials	230.00
10cc Dihydrostreptomycin Solution — ½ gm. per cc Expires January 1962	10 Vials	5.70
	100 Vials	52.00
	1000 Vials	480.00
100cc PFIZER Combiotic expires January 1962	1 Vial	4.95
	5 Vials	23.00
	10 Vials	42.50
	100 Vials	400.00

Penicillin Tablets — Soluble — 100,000 Units	100	1.35
	1000	12.00
	5000	53.00
Penicillin Tablets — Soluble — 200,000 Units	100	2.40
	1000	21.50
	5000	100.00
Penicillin with Triple Sulfas — 300,000 Units	100	4.00
	1000	36.00
5cc Acth-Gel — 40 units per cc Standard Brands	1 Vial	2.50
	10 Vials	22.50
	100 Vials	210.00
100 Stearane 5 mg		9.50
5 x 100 Stearane 5 mg		45.00
Prednisone or Prednisolone — 5 mg — Specify	100	3.75
	1000	32.00
	5000	150.00
10cc Vitamin B_{12} — 1000 Mcg. per cc Crystaline — U.S.P.	1 Vial	2.25
	10 Vials	20.00
	100 Vials	180.00
	1000 Vials	1700.00

Minimum Shipping Order $25.00. Postage prepaid. Check with order.

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Cyanamid reports to the veterinarian

Whether your practice is large animal, small animal, or both, you will find VARIZYME® helpful in the treatment of inflammations.

VARIZYME, by enzymatic action, liquefies fibrin and clotted blood and viscous exudates.

VARIZYME is being used everyday by practitioners in the treatment of abscesses, slow-healing wounds, edema, ulcers, pneumonia, chronic cough, otitis, mastitis, foot rot, sinusitis and other inflammatory conditions.

VARIZYME is versatile. It may be given intramuscularly, intravenously, by infusion, by irrigation, and as a wet pack.

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CYANAMID
VARIZYME

New, convenient, efficient way to treat porcine necrotic enteritis due to Salmonella choleraesuis

CLINICAL RESULTS: Field tests[1,2,3,4] indicate perorally administered FURACIN to be safe and specific for uncomplicated Salmonella infections and necrotic enteritis of swine and beneficial in other nonspecific enteric conditions of swine. Controlled laboratory studies[5,6] demonstrate that FURACIN Water Mix in drinking water for 7 consecutive days prevents mortality and aids in maintaining normal growth of pigs infected 2 days prior to treatment.

METHOD: Add FURACIN Water Mix to the drinking water in proportions of 330 Gm. (1 carton) to each 36 gallons. Continue medicated water for at least 7 days.

FURACIN®

BRAND OF NITROFURAZONE

WATER MIX

SUPPLIED: Carton of 330 Gm. Available from your professional veterinary distributor.

REFERENCES: 1. Vickers, C. L.: Personal communication. 2. Filion, R., and Trepanier, M.: Personal communication. 3. Lannek, N., and Brag, S.: Vet. Med. 49:75-78 (Feb.) 1954. 4. Felgate, C. A., and Swann, H. C.: Vet. Rec. 68:259-262 (May 5) 1956. 5. Guthrie, J. E.: Vet Med. 47:307-314 (Aug.) 1952. 6. Guthrie, J. E.: Personal communication.

NITROFURANS —a *unique* class of antimicrobials—neither antibiotics nor sulfonamides

EATON LABORATORIES, NORWICH, NEW YORK

for **MASTITIS** *of*

dry and lactating cows

NEW SQUEEJET[T.M.*]

single-dose dispenser for

FURACIN® SOLUTION *veterinary*

brand of nitrofurazone

- delivers one full dose
- is discarded after using
- saves time
- is convenient, especially when a number of cows are to be treated
- unique package

*design patented

FURACIN has been shown to be strikingly effective in controlling mastitis under field conditions.[1,2] Of 7,123 lactating cows with acute mastitis, fair to excellent results were obtained in 5,597 (78%). Of 3,418 dry cows which had had mastitis during their previous lactating period, fair to excellent results were obtained in 3,104 (90%).

SUPPLIED A water-miscible liquid of FURACIN 0.2% in polyethylene glycol and water. Single-dose SQUEEJET disposable dispenser of 30 cc. Still available, bottles of 500 cc. with rubber stopper and 1 gal.

1. Mires, M. H., and Chadwick, R. H.: Vet. News 10:3 (Jan.-Feb.) 1947. 2. Mires, M. H.: J. Am. Vet. M. Ass. 117:49 (July) 1950.

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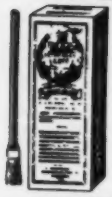

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The pinkeye medicine of choice among leading veterinarians around the world. Order from your favorite veterinary distributor.

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Honor Doctor Frank

Two emeritus staff members of Kansas State University were honored for distinguished faculty service and another staff member was honored as a distinguished

Dr. E. R. Frank

alumnus of K-State at the Gamma Sigma Delta banquet and initiation April 9 at the K-State Union.

The distinguished alumnus is Dr. E. R. Frank of K-State's surgery and medicine staff.

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FURADEX "... shortened the duration of diarrhea in comparison with previously used drugs, and in most cases produced an apparent complete recovery . . . (The diarrhea) generally ceased in 2 to 7 days without any side effect due to medication."[2]

Containing FURACIN® (brand of nitrofurazone) in an excipient of dextrose for peroral therapy, FURADEX is achieving striking results in bacterial and nonspecific diarrheas and in diarrheas associated with other diseases such as distemper and hepatitis. FURADEX has the advantage of being highly palatable to dogs, which facilitates treatment,[1,2] and is a point of superiority over other preparations.

SUPPLIED: 50 mg. scored ORA-BOLS, bottle of 100.

REFERENCES: 1. Pollock, S.: Control of Nonspecific and Specific Enteritis in the Dog; read at the First Regional Conference on the Nitrofurans in Veterinary Medicine, Wilmington, Delaware (June 5, 1958). 2. Fisher, G. W.: Oral Use of Furadex in Canine Diarrhea, N. A. Vet. **39**:133-134 (Mar. 15) 1958.

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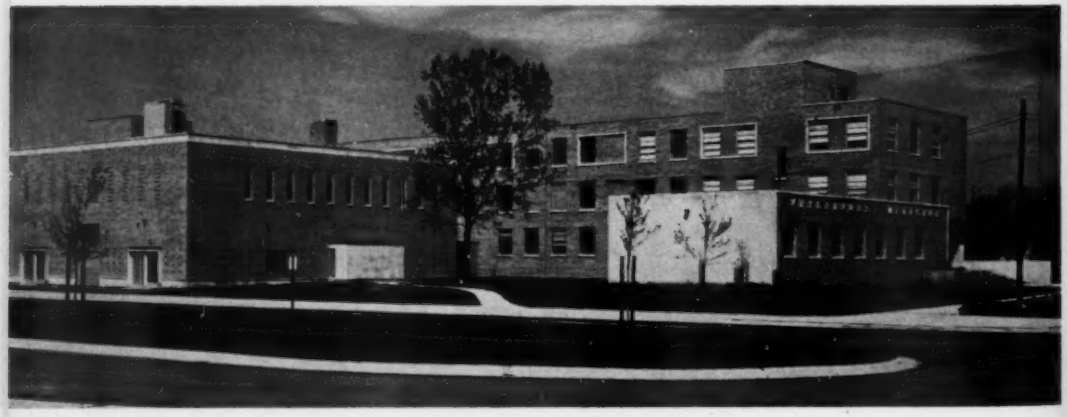
Form Breeding Association

Fifty veterinarians from all parts of California completed an extensive course of study in evaluating fertility efficiency at the University of California at Davis, April 25 and 26. Procedures of evaluating bulls, rams, and stallions were discussed, and standards were established which could be clearly understood by the owner and the veterinarian.

The program was arranged by University of California faculty members, under the direction of Dr. P. C. Enge, extension veterinarian, at the request of the California Veterinary Medical Association. Specialists assisting in the program included Dr. Enge, Dr. Blaine McGowan, Dr. Perry Cupps, Dr. John Kendrick, Dr. Clyde Stormont, Dr. R. V. Jessup, Reuben Albaugh, and Horace Strong.

After the course, attending practitioners formed the California Breeding Efficiency Association to continue further study of fertility in not only bulls, but also rams and stallions. Membership in the association is limited to veterinarians who have completed a similar specialized course of study in fertility evaluation. Dr. John Carricaburu of Santa Ynez was named president of the new organization; Dr. Joe Giambroni of Red Bluff, vice-president; and Dr. Sterling Rood of Chico, secretary-treasurer.

On June 16, Ohio State University dedicated Sisson Hall, new $2 million basic science building and headquarters for the university's College of Veterinary Medicine. The dedicatory program was a part of Ohio State's 28th Annual Spring Conference for Veterinarians, June 16 and 17.



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"FURACIN in its water-soluble base is completely soluble in body fluids. These properties make it ideally suited for the treatment of ophthalmitis and postoperative therapy."*

FURACIN Soluble Powder Veterinary is conveniently applied directly from the plastic puff-bottle.

These FURACIN products contain FURACIN 0.2% in water-miscible vehicles. Therefore, they may be left in wounds to be sutured.

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This anhydrous, water-soluble dosage form of FURACIN affords prompt relief of otic infections in small animals.

In canine otitis externa, poor drainage, plus the trauma of scratching and rubbing, often frustrates therapy. It is noteworthy that "FURACIN has been used successfully in this condition . . ."*

In cases of otitis in which exudate is present, you will find the drying effect of FURACIN Soluble Powder Veterinary to be most beneficial.

Available in dropper bottle of 1 fl.oz.

*Belloff, G. B.: Calif. Vet. 9:16 (Nov.-Dec.) 1956.

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for 20-90 minutes
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- decreases scratching, spread of lesions and self-mutilation
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Caution: Federal law restricts this drug to sale by or on the order of a licensed veterinarian. Professional literature available on request. For Dermatologic Use Only in Cats and Dogs Store in a cool place.

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Dettelbach to Jen-Sal Post

Dr. Harold R. Dettelbach assumed duties as the new Director of Research for Jensen-Salsbery Laboratories May 18, 1959. He

Dr. Harold R. Dettelbach

was awarded a Ph.D. degree from the University of Bern in Switzerland in 1952, was employed with the G. D. Searle Co. until 1957 when he became assistant to the Director of Exploratory Development for Smith, Kline and French Laboratories.

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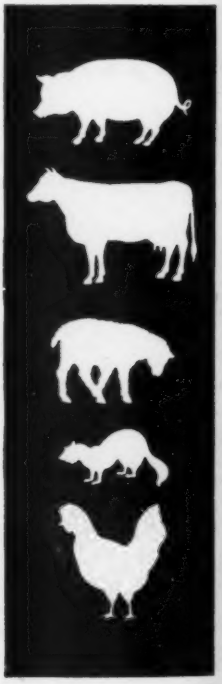

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General Kester Honored

General Wayne O. Kester was the recipient of the sixth annual Zeta Award presented by Omega Tau Sigma, an international professional veterinary fraternity. The Zeta chapter of Omega Tau Sigma, located at the Alabama Polytechnic Institute, Auburn,

honored General Kester for his outstanding contributions in the field of veterinary medicine and allied fields.

Shown above are General Wayne O. Kester, recipient; Don Farris, president of the Zeta chapter, Omega Tau Sigma Fraternity; Dr. James E. Greene, dean, School of Veterinary Medicine, Alabama Polytechnic Institute.

General Kester, a 1931 graduate of the School of Veterinary Medicine, Kansas State College, is retired Chief of the Veterinary Service, United States Air Force and a past president of the American Veterinary Medical Association. At present he is president of the American Association of Equine Practitioners.

Doctor Smith to USDA Post

Appointment of Dr. Louis H. Smith as veterinarian in charge of the USDA Animal Disease Eradication activities in Cheyenne, Wyoming, effective June 1, 1959 was announced recently. In his new assignment, Doctor Smith will be responsible for administering programs dealing with control and eradication of brucellosis and tuberculosis of cattle, sheep and cattle scabies, bluetongue of sheep, and other major diseases of livestock.

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Sun Ray's scientifically designed and engineered grinders assure you of blades correctly ground to professional sharpness every time.

Easy to Use. No previous experience or special skill necessary. Just remove blades from clipper . . . place on grinder — THAT'S ALL! Avoid waiting for blades. Save on periodic grinding costs.

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A complete grinding ensemble . . . the ultimate in versatility — HONES, GRINDS, SHARPENS & POLISHES (note protective guard & adjustable grinding rail)

Royal 6—6" Metal Disc & Stone Wheel

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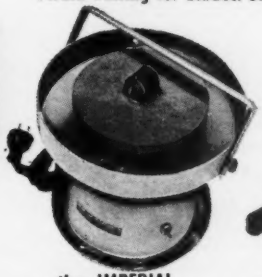
NEW Patent BLADE HOLDER with every Sun Ray grinder

Simplifies grinding — saves wear — prevents abrasions



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Fast grinding stone wheel that guarantees super sharp blades every time (note protective guard ring and adjustable grinding rail)

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These laboratories have been established to aid veterinarians in the diagnosis of obscure as well as common ailments in large and small animals. The chief aim of our staff is to give quick and accurate diagnosis at all times.

Our service includes fecal examinations, anti-biotic sensitivity tests, urinalyses, blood counts, tissue sections, bacteriological cultures, cultures for ringworm and blood chemistry. It is designed to assist owners and breeders of stock of all kinds including dogs, cats, horses, cattle, poultry, hogs and sheep.

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Veterinary Calendar

Jul. 10-12. **Nebraska Veterinary Medical Association,** summer meeting. Pawnee Hotel, North Platte, Nebraska. Dr. H. E. Hedlund, Wahoo, Nebraska, program chairman.

Jul. 13-14. **Kentucky Veterinary Medical Association,** 48th annual convention. Sheraton-Seelbach Hotel, Louisville, Kentucky. Dr. L. S. Shirrell, 545 East Main, Frankfort, Kentucky, secretary.

Jul. 19-22. **Alabama Polytechnic Institute,** 52nd annual conference for veterinarians. School of Veterinary Medicine, Auburn, Alabama. (Housing facilities will be available for married couples.) Dr. J. E. Greene, A.P.I., Auburn, Alabama, dean.

Jul. 20-22. **Canadian Veterinary Medical Association,** annual convention. Ontario Veterinary College, Guelph, Ontario, Canada. Dr. H. J. Neely, Ontario Veterinary College, Guelph, Ontario, chairman.

Jul. 26-28. **Arkansas Veterinary Practitioner's Association,** annual meeting. Mather Lodge, Petit Jean State Park, Morrilton, Arkansas. Dr. W. H. Babbitt, 204 East 13th Street, North Little Rock, Arkansas.

Jul. 26-29. **Mississippi State Veterinary Medical Association,** annual meeting. Buena Vista Hotel, Biloxi, Mississippi. Dr. J. W. Branson, Jackson, Mississippi, secretary-treasurer.

Aug. 23-27. **American Veterinary Medical Association,** 96th annual meeting in conjunction with **Third Pan American Congress of Veterinary Medicine.** Municipal Auditorium, Kansas City, Missouri. Dr. H. E. Kingman Jr., 600 S. Michigan Avenue, Chicago, Illinois, executive-secretary.

Sep. 3-4. **Colorado Veterinary Medical Association,** annual meeting. Shirley Savoy Hotel, Denver. Dr. Gail H. Gilbert, 5500 Wadsworth Avenue, Arvada, Colorado.

Sep. 21-22. **New Mexico Veterinary Medical Association,** annual meeting. Western Skies Hotel, Albuquerque, New Mexico. Dr. E. R. Leslie, Carlsbad, New Mexico, secretary.

Oct. 7-9. **Purdue University, Conference for Veterinarians.** Purdue University, Lafayette, Indiana. Dr. L. M. Hutchings, chairman, Conference Committee.

Oct. 15-16. **Eastern Iowa Veterinary Association,** 46th annual meeting. Hotel Roosevelt, Cedar Rapids, Iowa. Dr. Charles B. Thayer, Iowa City, Iowa, secretary.

Oct. 29-31. **Animal Care Panel,** annual convention. Sheraton Park Hotel, Washington, D. C. Dr. William I. Gay, 2101 Constitution Avenue, N.W., Washington 25, D. C., chairman.

Nov. 2-3. **University of Missouri,** 35th annual veterinary conference. School of Veterinary Medicine, Columbia, Missouri. Dr. Cecil Elder, chairman.

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(hydrocortisone acetate, neomycin sulfate, procaine penicillin G, polymyxin B sulfate)

broad antibacterial action . . . effective anti-inflammatory action.

Packaged in disposable Xpresit* for easy administration.

equine gastrointestinal parasites:

PARVEX*

(piperazine-carbon disulfide complex)—safe for horses of all ages . . . potent action to remove bots, large and small strongyles, ascarids and adult pinworms.

Available as bolus or suspension.

acute or chronic infection with stress and inflammation:

BIO-DELTA*

(procaine penicillin G, dihydrostreptomycin, prednisolone)

fast-acting, potent glucocorticoid/anti-inflammatory agent.

Available as a sterile aqueous suspension.

dermatitis, arthritis, bovine ketosis:

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glucocorticoid potency in its most adaptable form.

Available as a sterile aqueous suspension and tablets.

Check your dispensary now . . . it's time to restock these pharmaceuticals.

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Science turned to healing . . . **Upjohn**

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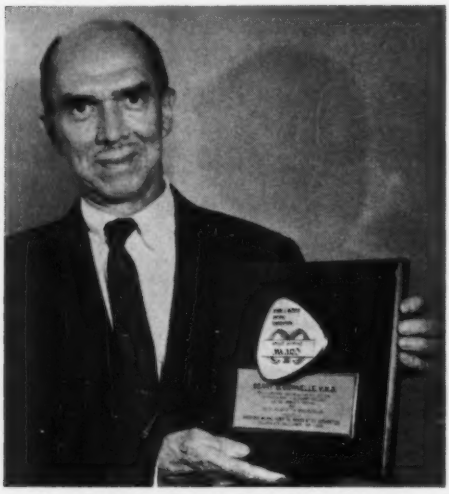
Small Animal Award to Schnelle

Dr. Gerry B. Schnelle, chief of staff of Angell Memorial Animal Hospital, Boston, was given the Small Animal Award of the Morris Animal Foundation for his numerous contributions to the small animal field of veterinary medicine.



A plaque was presented to Doctor Schnelle at the annual convention of the American Animal Hospital Association in Colorado Springs. The award also carried a $500 stipend.

Doctor Schnelle was cited for conducting research on a clinical basis at Angell Hospital; for his belief that teaching and research are essential to a good animal hospital; and for his convictions that teaching benefits both the young veterinary graduate and the seasoned veterinary practitioner.

The Morris Foundation sponsors research at numerous veterinary colleges and fosters an appreciation of research among veterinarians.

Jungherr to Retire

Dr. Erwin L. Jungherr, Head of the Department of Animal Diseases at the University of Connecticut, will retire July 1.

Doctor Jungherr will join American Cyanamid Co. as pathologist in the Viral and Rickettsial Research laboratory in Pearl River, N. Y.

Doctor Jungherr has been responsible for a major share of the pioneering research in the role of viruses in poultry diseases. He has taught at the university and conducted research at the Storrs Agricultural Experiment Station since 1930.

Midwest Feed Group Wins

The Midwest Feed Manufacturers Association, Kansas City, has received a special award from the Chamber of Commerce of the United States.

The award was presented to Mr. Ray Ammon, immediate past president of Midwest, and director of the feed division, Quaker Oats Company, St. Joseph, Missouri, for "Initiating and carrying out a program to bring to practicing veterinarians the latest scientific findings in the field of animal and poultry nutrition research with the aim of improving and increasing the nation's food supply." Mr. Arch Booth, executive vice president of the Chamber of Commerce of the United States, presented the award in the form of a silver plaque.

Murphy to Pennsylvania Post

Dr. James M. Murphy, of the New York State College of Veterinary Medicine at Cornell University, who is recognized as one of the world's outstanding clinical investigators of bovine mastitis, has been appointed research professor of veterinary medicine at the University of Pennsylvania School of Veterinary Medicine.

He will assume his new post at the school's 320 acre field station at New Bolton Center, Chester County, July 1.

Manley Assumes USDA Position

Appointment of Dr. David O. Manley as Veterinarian in Charge of the USDA Animal Disease Eradication activities in Topeka, Kansas, effective June 1, 1959 was announced recently.

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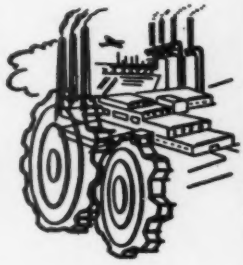

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Killed Virus, Caprine Origin

Absolutely safe for all animals . . . may be used in young puppies . . . 20% phenolized tissue . . . produces strong immunity . . . subcutaneous or intraperitoneal injection. With certificates.

10—5 cc (10 doses); 50 cc ; 10-50 cc

Live Virus Modified, Chick Embryo Origin

Made specifically for dogs . . . produces superior, long lasting immunity . . . special stabilizer insures high live virus content . . . tested for absolute safety. With certificates.

5-3 cc (5 doses) ; 30 cc; 10-30 cc

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Rabid Dogs Lose Bout with Police
LEMARS, Ia.—Special: A fierce 10-minute battle between two rabid dogs and two police officers ended safely for the policemen here Monday when they poured a volley of shots into the raging animals.
Two stray shorthaired mongrels, one white and one brown, came running up the road from the south and charged a group of small children playing in the [redacted] home yard in the southeast part of town near Cleveland park.
The frightened, screaming children ran into the Lewis home with the rabid dogs at their heels.
After racing through the upstairs rooms, snarling, barking and foaming at the mouth, the dogs finally dashed into the basement of the house. Meanwhile, Mrs. [redacted] herded the crying children into a bedroom and ran to a neighbor's house to telephone police. She had no phone in her home. [redacted] and [redacted] answered the call. When they opened the basement door slightly, the large brown dog hurtled through the doorway, jumping on top of [redacted]. [redacted] fought off the furious attack, kicking and defending himself as best he could, but could not use his gun.
As the enraged animal pounced upon [redacted] he poured a volley of shots into the dog. The wily mongrel put up no fight but lay on the floor moaning and shrieking and foaming at the mouth. He then shot the other dog. Neither of the men was bitten by the dogs.
Dr. [redacted], [redacted] veterinarian, examined the dogs and declared them rabid. The bodies were burned. Dr. [redacted] warned farmers and others to be on the lookout for rabid animals as the dogs may
ON THE
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Contains Lorothidol®, an antibacterial and antifungal agent; lindane, an insecticide; Thenfadil®, an antihistamine; in an oily solution.

Effective treatment of sarcoptic and demodectic mange in dogs and cats.

- **Effective**
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- **Non toxic**
- **Economical**

SUPPLIED in bottles of 8 fl. oz. (with detachable label), package of six bottles, and in 1 gal. bottles.

Literature and prices on request.

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CORVAC Hog Cholera Vaccine

A standard, well-known, modified live virus hog cholera vaccine for use with 10 cc. of serum or 5 cc. of SERATRATE. CORVAC, like all other CSL products, is available only to the veterinary profession.

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Hog Cholera Antibody-Concentrate

The globulin fraction of hyperimmune porcine blood, adjusted to at least twice the potency of anti-hog cholera serum. New convenience for modern practitioners, available now in 250 cc. vials cartoned in dozens.

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